Online Education
Teaching in a Time of Change

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Online Education: Teaching in a Time of Change

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INTRODUCTION

Online Education: Teaching in a Time of Change

This proceeding publication is the outcome of the virtual conference, Online Education: Teaching in a Time of Change, held in April 2021. It was coordinated the research group AMPS, its scholarly journal ArchitectureMPS published by UCL Press together with several universities: Ball State University, USA; Beaconhouse National University, Pakistan; University of Pretoria, South Africa; University of Kassel, Germany. It offered a platform for multiple and diverse perspectives and interpretation of online education and research as it stands today.

The unprecedented changes faced by the world in 2020 produced many challenges and opportunities for the global academic fraternity. Educational systems required a sudden shift in teaching methods, communicative techniques, the use of the latest digital tools, and a quick revision of learning outcomes. On the brighter side, teachers and students proved adept at embracing innovation, and "online education" helped academicians connect across the globe; although the success of the transference to online education was not uniform, with some struggling with questions of accessibility and the ability to explore the online possibilities of this new era.

In the midst of it all, platforms like the Khan Academy and Skillshare got more attention than ever due to their effective online education structure, and disciplines whose assessment and delivery modes are heavily lecture and test-based, tended to thrive. On the contrary, those disciplines that require a physical presence due to the nature of their teaching or reliance on peer-to-peer learning, tended to suffer. Skills-based courses and exercises such as model making lost contact with the "materiality" of their subject matter. Science programs, reliant on lab experiments struggled to replace the materials or prototyping they depend on and, for the main part, the dynamic interaction of the design studio was reduced to interaction through a smartphone or computer screen. Overall, the relocation to virtual classrooms, online studios and remote seminars affected the standard work cycles of educators and researchers to such an extent that the repercussions are still to be understood. It all affects the current debate on online education.

The papers collated in this publication, and the conference which it documents, reflect the diverse perspectives of educators at this point in time. They offer a synoptic view of researchers and professionals who together are reconfiguring the possibilities of the new and emerging pedagogical realm.

Zain Adil

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ART SCHOOLS AND ARTIST-LED COLLECTIVES: HOW TO MAKE A HAPPENING (1968/2020) A WORKSHOP IN VIRTUAL SPACE

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INTRODUCTION

On the 24th of April 2020, following the realization that lockdown measures had brought a temporary suspension of physical 'in-person' teaching, efforts had to be made to re-model courses in Higher Education and move to online and distance learning formats. As such, the initial plan to deliver a performative lecture to Level 5 (second year) Fine Art students in an off-site project space, needed to be re-thought in a way that would capture both the same learning outcomes but also be comparable in its content. Fortuitously, this section of the module did not require direct assessment as it was in the form of a voluntary 'student sign-ups'. As a result, I decided to take the opportunity to carry out an experimental format of an online semi-performative lecture in order to initiate a workshop within the overall 'off-site' project.

The workshop itself was based on the re-imagining of the 'happening' a highly prominent form of artistic activity developed by the Fluxus movement. Focusing on the rules of Fluxus 'happenings' outlined in 1968 by Allan Kaprow.[1] The workshop became an experimental space to re-imagine these rules during a global pandemic and to challenge the notions of place and locality in virtual environments. The concept of the 'happening' was chosen because it provided both a tangible framework for the students to engage within this current climate and is discursively linked to collective practices.[2]

This situation provided an opportunity to test out an observation which had emerged from my PhD research. The main locus of this observation was in a trend in which artist-led collectives tended to form within environments such as universities.[3] Indeed, within a mapping study of collectives forming in the city of Leeds that I carried out as part of the empirical research for my thesis, I found that 50% of collectives formed and, or, appeared within the art school environment.[4] This was the single highest locality within the study and posed two specific questions. Firstly, why was this frequency occurring and secondly, what could be learned from these occurrences. The latter being the most pertinent to this paper. Of course, this study was limited to one city of the duration of a year. However, this trend also has historical and contemporary precedence within artistic discourse. There have been countless examples of collectives forming in educational environments from the eponymous, Toronto based collective General Idea in 1969 to the anarchic video collective Everything is Terrible in 2000. Indeed, over the last three decades the UK has seen a myriad of instances of self-organized artist-led

collectives from Leeds 13 to Turner Prize winning Assemble in 2015. The instances of these forms of activity are nothing new within the sphere of art education and would not prompt undue attention by educators and academics. However, the study of such phenomena is relatively under-researched; notably exceptions are Gareth Stedman Jones's essay *The Meaning of the Student Revolt* which emphasizes that the period of group learning can foster collective consciousness within a cohort.[5] Similarly, Silvie Jacobi's study of art schools as fostering a sense of place and thus identity through emerging emplaced practice.[6] Yet, these studies focused on broader educational and often generalized outcomes by categorizing artist-led collectives under a broader rubric of artistic self-determination that encompasses a spectrum of artist-led activity. Instead, I argue that in order to move towards a more in-depth understanding of artist-led collective activity within the institutional space of the art school, and its potential outcomes for art education and pedagogy, a more nuanced conceptualization of the conditions which are leading to the phenomena is required. Further, what are some of the implications for artistic collective practices within the virtual learning environments brought about by the pandemic.

The specificity that I am referring to here is captured in identifying the conditions which are unique to the art school environment. In the recent publication *Come Together: The Rise of Cooperative Art and Design* Francesco Spampinato argues that 'collectives are often born from preexisting communities'.[7] On the face of it, this statement might seem obvious, that collectives have a higher probability of forming where there is already pre-existing commonality. However, the statement reveals several important threads. Firstly, that collectives tend to form where there are pre-existing resources as developed and or shared within communities. This process was articulated by Robert Hollands and John Vail in their research on 'artistic clustering'.[8] The author's outline that artistic clustering is an important factor in the development of collectives and that in order to 'advance our understanding of the complex relationship between art and locality. In doing so, we emphasize the need to draw together three elements of place: geographical location, material form, and place as meanings and values'.[9] This concept of artistic clustering begins to explain why the art school environment has become a hotbed of artist collective activity. The art school acts as a geographical focal point, or site in common for a community to develop which includes students, lecturers, technicians, arts professionals etc. Interrelated to this is access to material factors such as studios, workshops, physical and digital materials/tools. It could be argued that in isolation these elements of place would not necessarily lead to the development of collectives. However, the importance of meaning and values within the art school environment becomes an important factor involved in the development of collectives. If I return to Spampinato's statement, the second thread in play is that communities tend to coalesce around shared ideas and ideals, even if there are differences at an individual level. The art school as an educational institution teaches its students a broad range of historical, theoretical and socio- political ideas. In other words, they are exposed to different forms knowledge and encouraged to be independent critical thinkers. Yet, this teaching can also coalesce around collaborative and collective forms of practice both through research studies components and through studio environments.

In her work on support structures within the artworld curator Celine Condorelli explored the importance of friendship in the development of self-organized practice. Condorelli suggested that 'Friendship is treated both as an association with other people and with ideas, a befriending of issues'.[10] Further, Condorelli stresses that these entities often form through 'friends in action'.[11] Here is the crux of the matter, I argue that exposure to a diverse set of ideas and thus values coupled with the interrelationship of elements of place is creating the ideal conditions for artist-led collectives to

form within art schools. However, with the enforced rise in distance/virtual learning because of the pandemic are those conditions being changed and further what can we learn from this development.

STRUCTURE OF THE WORKSHOP

It is important at this juncture to outline the reasoning behind the decisions made in developing the concept for the workshop. The workshop was designed to maximize the conditions which lead to collective formations yet adapted to the virtual learning environment. It consisted of a lecture in which I delivered a history of collectivism from the re-imagined 19th Century medieval guild to the elements of inter-war proto-collectivism in the USSR, to the explosion of collective practices in the post-war period, which included early Fluxus that foreshadowed contemporary artist-led collectivism.[12] The workshop then became a focused online discussion around the Fluxus rules and the potential to re-imagine a 'happening' in virtual space. The students then self-organised in order to initiate the planning process and then returned to the main workshop to feedback on their ideas. The duration of the workshop was one teaching days' worth of time and when the students returned for the feedback session at the end of the day, they had self-organised into two groups each with a specific interpretation of the '11 rules of the game' as outlined by Allan Kaprow in his work *How to make a Happening*.[13] The workshop was held using online video conferencing programs Zoom and Google Meet. This multi-platform combination was chosen because of the specific institutional policy around use of specific platforms to deliver teaching and also, at the time, Google Meet did not have the capacity to implement virtual backgrounds which was a key part of the visual presentation of the lecture as the Fluxus rules would remain on the screen behind my live feed whilst I shared the lecture presentation with the students. The combination of platforms would become a key theme in both my delivery of the workshop but also how the students navigated the design, creation and 'staging' of their online happening. From the initial workshop the students worked on their happenings until the end of the 'off-site' project. This was a duration of fourteen days (including the workshop day).

METHODOLOGY

The following textual analysis is based on the feedback given by the students at the end of the workshop and some durational feedback I received early this year. The methodology which I employed was based on Relational Dialectics Theory (RDT) developed by Barbara Montgomery and Leslie Baxter in 1988.[14] RDT is a form of communication theory which I had previously employed throughout my PhD research into collectives because it provides a framework to study the complexity of communications and often contradictory relationships which form artist-led collectives and crucially 'does not place at its theoretical centre the economic contradictions between the forces of production and consumption'.[15] Thus, it becomes a more holistic methodology based on contradiction, totality, process and praxis which is more congruent with the subject matter at hand. Crucially, RDT also provides a potential method for textual analysis through a set of 'dialectical unified oppositions' that occur within the relationships which form artist-led collectives. These unified oppositions are illustrated in Figure 1.

	Internal Dialectic Relationship (within the relationship)
Integration-Separation	Connection-Autonomy
Stability-Change	Certainty-Uncertainty
Expression-Nonexpression	Openness-Closedness

Figure 1. dialectical forces within relationships

Through analyzing the words, phrases and sentences that the students used in response to the questionnaire I began to trace specific dialectical tensions within the two project groups. This 'mapping' was then utilized in order to form conclusions and draw out further questions for future research.

ANALYSIS

In terms of the project workshop the students self-organized into two groups. These groups presented as a complex mix of social bonds based on friendships and newcomers as outlined by a several students in their feedback. Student A stated that 'during the creation of the happening, I was able to communicate with people on the course who I have never spoken to before due to a difference in creative practices'.[16] Similarly, student B stated that 'it was great to get to know some people from other fine art studio areas that work differently to me'. Both of these student responses exhibit typical dialectical tensions between connection-autonomy and openness-closedness. They characterize a difference in working practices which had previously been a barrier (closedness). Yet, a willingness and excitement at the potential collaboration (openness). Similarly, phrases such as 'great to get to know some people' revealed the yearn for (connection) and conversely, phrases such as 'work differently from me' revealed the (autonomy) of the individual.

These initial sets of interrelationships are quite typical for the formation of collectives where core friendships function as nodes for others from outside (or 'external' to use the RDT terminology) of those circles to join. This is often due to a complex set of contradictory forces including skills gaps, differences and similarities in ideas and interests.[17] Of course, the workshop acted as a further catalyst to accelerate this initial period which can take months and even years in practice. However, the overall dialectical forces of integration-separation were present within the student responses.

Perhaps the most startling emerging finding relates to my initial working hypothesis. Prior to this experimental workshop, much of the research carried out in the field had assumed the requirement of physical embodied experience of being with others and thus the development of 'place-imprinting' through those social bonds and relationships. This was characterized by Montgomery and Baxter as, 'a special form of communication not understandable through public traditions or individual predispositions'.[18] In other words, friendships and close social-bonds that form artist-led collectives require the comprehension of each other beyond the spoken or written word, something that requires physical bodily presence. This is of course not possible in the atomised virtual form of communication; even through the video image a form 'flatterning' occurs by the mediated

technology.[19] Conversely, what has emerged through this analysis of the language narrates a different story. In the student feedback specific words and phrases began to appear such as 'get to know some people', 'togetherness', 'community' and 'we' coupled with 'individual', 'own perspectives' and 'I' which revealed a typical set of dialectical unified oppositions that would be strongly present within artist-led collective practices. Further still, student C stated that 'We were all working towards the same thing so there definitely was an element of community and togetherness'.[20] This 'working towards the same thing', is a core identity trait for artist-led collectives and it actively contributes to the social-bonds which instigate collective action, or as Condorelli states 'friends in action'.[21] This is not to suggest that this workshop was able to artificially force the development of friendships or even a fully-fledged collective, yet from the language used by the students there was a trace of thinking collectively. This was articulated by student D 'At first, we were all rather confused as to what we needed to do, however this brought us together as a group to collectively try to understand. After that, we started working well as a team – supporting each other through messenger and sharing opinions'.[22] This statement illuminated how and why both groups successfully developed project outputs in the virtual environment. Each group utilized a variety of social media, video communications and shared working platforms. By playing to the strengths of each platform they were able to develop coherent channels for communication. For example, Facebook Messenger was used to create smaller interpersonal communications between a few individuals and video messaging on Google Hangout was used to work as an entire group to make more general decisions. This constant communication on different levels is the type of activity which would occur in the studio or shared space, it cannot be said to mimic the total comprehension which comes with the physical closeness to bodies and the non-verbal language which is communicated in such situations. However, it was sufficient in this case to aid coherence of communication through multi-layered interpersonal relationships within each group.

Following this thread leads to the suggestion that forms of virtual spaces could indeed form a momentary sense of place within virtual environments. On this note, the happenings themselves were developed over long periods of time and culminated in sequential short films.[23] Both films consisted of the students creating a temporal sense of place by compiling, editing and curating events of their isolated lives in one space for the viewer to experience. The tensions between connection-autonomy in these films creates a form of disjointed temporality as their normally separate autonomous actions were purposefully recorded and brought together (connected) in virtual space for the viewer to 'read' these films in a narrative format.

One of the most surprising and revealing aspects of this experiment has been on a longitudinal level. As explicitly reported in the feedback by Student E when asked if they would consider working/forming a collective in the future. Student E stated 'Definitely! A few people from the happening have teamed up with other people on the course to create an online exhibition'.[24] This was echoed by other students throughout their feedback, they intermated that the workshop was the initial catalyst for further sustained activity. Interestingly, the students suggested this continued activity was developed through several members of the original workshop groups and others from across the course. This is indicative of the stability-change unified oppositions because once the initial 'place-in-common' (the workshop/happening) was removed from the equation then much of the stability and focus would change and shift. However, from Student E's statement it is clear this change had created a new place-in-common for some of the original students to engage with others through a similar online exhibition platform. It remains to be seen whether this would emerge into fully actualized collective action or collectives forming directly from this workshop. Yet, the notion that the physical isolation of remote working/learning can stifle this form of activity is perhaps not entirely correct.

CONCLUSION

What is emerging from this research is that my initial hypothesis in which artist-led collectives needed the embodied experience of physically being with each other to fully comprehend their existence may not be entirely correct. Indeed, what has begun to emerge is the possibility that meaningful relationships can form within virtual learning environments between students. This is despite the fact that other essential factors such as access to resources were scarce for most students. This workshop has thus hinted at something far more profound that the bricks and mortar of the institution may not be as influential as it first appears, but in fact it is the interplay of the ideas in common and the means of communication that can lead to the development of artist-led collective practices within art schools. A vital learning outcome from this experiment was the role which I played as educator. For this activity to occur in this way the students needed autonomy to self-organize as they did into two groups and create their own work without dictation. Instead, I acted as a facilitator providing a subject matter and a history of collectivism as a starting point for them to explore their own possibilities. In a sense, this mimics the institutional environment and what occurs undefined within the art school environment, but defined in this form of workshop, it acts as a catalyst for potential collective action to develop.

There is of course limitation to this study including the fact that these students had previously experienced one academic year pre-Covid. This workshop would need to be repeated many different times in different universities, colleges, and art schools. However, it does provide a tantalising set of questions on the nature of place in the virtual, collective practice and the possibility of facilitating the conditions for artist-led collectives to form in an increasing post-studio environment.[25]

NOTES

[1] "Allan Kaprow - How to Make a Happening," YouTube video, 24:51, "hansenradiosatelite," September 21, 2013, https://www.youtube.com/watch?v=8iCM-YIjyHE.

[2] "Art Term," Art Terms- Fluxus, accessed May 11, 2021, https://www.tate.org.uk/art/art-terms/f/fluxus.

[3] John David Wright, "The Ecology of Cultural Space: towards an understanding of the contemporary artist-led collective" (PhD diss., University of Leeds, 2019).

[4] Wright, "The Ecology of Cultural Space," 245.

[5] Gareth Stedman Jones, "The Meaning of the Student Revolt," in Student Power: Problems, Diagnosis, Action, ed. Alexander Cockburn and Robin Blackburn (Harmondsworth: Penguin Books, 1969), 25-56.

[6] Silvie Jacobi, Art Schools and Place: Geographies of Emerging Artists and Art Scenes (London: Rowman & Littlefield Publishers, 2020).

[7] Francesco Spampinato, Come Together: The Rise of Cooperative Art and Design (New York: Princeton Architectural Press, 2014), 7.

[8] Robert Hollands and John Veil, "Place imprinting and the arts: A case study of the Amber Collective," Local Economy 30, no.2 (2015): 173-190, DOI: 10.1177/0269094215573170.

[9] Hollands and Vail, "Place imprinting and the arts," 173.

[10] Céline Condorelli, "In Support: a theoretical and practical investigation into forms of display" (PhD diss., University of London, 2014), 15.

[11] Condorelli, "In Support," 15-16.

[12] Wright, "The Ecology of Cultural Space," 62-97.

[13] Allan Kaprow, "How to make a Happening" Primary Information, accessed May 11, 2021 https://primaryinformation.org/files/allan-kaprow-how-to-make-a-happening.pdf.

[14] Leslie Baxter and Barbara Montgomery, Relating: Dialogues and Dialectics (London: The Guilford Press, 1996).

[15] *Baxter and Montgomery, Relating, 4.*

[16] Student A, 'Workshop Project Questionnaire', Questionnaire 1, 2020.

[17] Student B, 'Workshop Project Questionnaire', Questionnaire 2, 2020.

[18] Wright, "The Ecology of Cultural Space".

[19] Baxter and Montgomery, Dialectical Approaches to Studying Personal Relationships (London: Psychology Press Taylor & Francis Group, 2008), 162.

[20] Christian Willemse et al., "Communication via warm haptic interfaces does not increase social warmth," Journal on Multimodal User Interfaces 12 (2018): 329–344, https://doi.org/10.1007/s12193-018-02760.

[21] Student C, 'Workshop Project Questionnaire', Questionnaire 3, 2020.

[22] Condorelli, "In Support," 15-16.

[23] Student D, 'Workshop Project Questionnaire', Questionnaire 4, 2020.

[24] Fine Art Students L5, 'Making a Happening', LAU Fine Art Blog, accessed May 11, 2021 https://laufineart.wordpress.com/2020/05/19/making-a-happening/.

[25] Student E, 'Workshop Project Questionnaire', Questionnaire 5, 2020.

[26]Sharon Butler, "Lost In Space: Art Post-Studio", The Brooklyn Rail, accessed May 11, 2021 https://brooklynrail.org/2008/06/art/james-harithas-with-raphael-rubinstein

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"THE CHILD WHO HAD TO GROW UP": USING SCENARIO PLANNING TO PREPARE FOR UNCERTAIN FUTURE CONTEXTS IN DIGITAL EDUCATION

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INTRODUCTION

The age of COVID-19 has ushered in not just new uncertainties, but new awareness of the turbulent and challenging environment in which institutional teaching and learning takes place. These uncertainties have emerged not just from the virus itself, but from the various responses to it, and the consequences of those responses in turn. Impacts have been particularly evident in the digitalisation of education, as institutions move to online and hybrid provision in a range of circumstances, across a range of platforms.

This paper explores the possibility of using scenario planning - understood as the construction of imagined future contexts to inform strategy - to support teaching in a time of change. It offers a broad introduction to the topic before exploring the application of the Oxford Scenario Planning Approach, and the case study of a future-of-schools scenario project delivered for the University of Oslo on the eve of the COVID-19 outbreak. It argues that scenario planning can help decisionmakers to reframe their perspective on the future which awaits them, highlighting issues and challenges which were previously overlooked.

FACING WILD AND FERAL TIMES

The coronavirus pandemic is just one of the most dramatic examples of a world-shaking event that seemed for many to "come out of nowhere", yet it is far from the only one this century: one might think of the 9/11 attacks in Washington, D.C. and New York, or the global financial crisis of the 2010s.

In each of these cases, the event was not impossible to predict, but for many it lay outside of the frame of what they expected or thought worth preparing for. As Beatrice Weder di Mauro of the Centre for Economic Policy Research put it in a 2020 interview about the global economic impact of COVID-19, "There was no imagination to see where something like this could come from."[1] Actors believed they were operating under conditions of reasonable certainty, only to find themselves experiencing what Ramírez and Wilkinson have called "TUNA conditions": contexts characterised by turbulence, uncertainty, novelty and ambiguity.[2]

In addition, the future under such TUNA conditions can be typified, as Ramírez and Ravetz have done, as "wild" or "feral".[3] In their taxonomy, drawing on Rittel and Webber's notion of "tame" and

"wicked" problems,[4] "tame" conditions apply when we have justifiable expectations of what the future will hold based on prior experience: the authors give the example of crossing the street, where the pedestrian makes a decision to cross based on their understanding of traffic rules, vehicle speeds and driver behaviour, and their own physical capabilities. A tame problem can be compared to a puzzle: it "may be complicated but is resolvable through unilinear acts and it is likely to have occurred before".[5] Under "wild" circumstances, however, "[o]n the basis of past experience [...] we know that in the future also there will be surprises, events that could not have been predicted in advance"[6] -- the "unknown unknowns" which then-US Defence Secretary Donald Rumsfeld made infamous at a press briefing in 2002.[7]

"Feral" conditions come to exist when the seemingly tame situation becomes wild, "when futures previously considered to be predictable are expected that they might become unpredictable, without having been thought to be unpredictable to start with."[8] Taking the model of the domesticated animal which lapses into a wild condition, Ramírez and Ravetz indicate that we face feral futures when our own actions cause apparently tame conditions to become turbulent and uncertain, and "human intervention create[s] an unwanted unfolding situation that could not have occurred in the wild."[9]

This notion of the "feral future" is especially relevant for those of us studying the transition to new online pedagogical tools and techniques during the times of COVID-19. The TUNA conditions experienced by education institutions have not solely emerged from the characteristics of the novel coronavirus itself, but from the complications which have ensued as communities and organizations have sought to respond to the pandemic in more or less haphazard ways. The transition to novel and technologized ways of teaching and learning under the pressures of a global health emergency is a far from "tame" journey, requiring as it does the coordination of a wide range of social and technical systems involving many actors with different priorities.

Ciborra has indicated "the importance of the unfinished, the untidy, the irregular, and the hack as fundamental systems practices"[10] within information technology. He gives the example of the Russian MIR space station as a complex technical achievement which incorporates, "hand in hand, advanced, robust engineering solutions, rustic design, and widespread virtuoso tinkering (what the French call *bricolage*) to keep the equipment and the system going as a whole."[11]

Those of us who spent parts of 2020 balancing a laptop on a "stand" improvised from the fattest books we own, trying to bribe our children to stay off camera with a biscuit, Googling to see how to use a half-remembered feature of the software we've just been trained on, all while also considering the advantages, disadvantages, and privacy implications of the various platforms we have been requested to use, will recognise the truth of Ciborra's assessment - as will those who have been urgently tasked with finding and installing platforms or solutions that can deliver the requirements of teaching and learning in a fast-changing, hard-to-predict environment.

Under these circumstances, when the future may not behave according to the models of the past, and our own actions may create untoward "feral" situations which would not have otherwise occurred, scenario planning offers a way to bring together a range of stakeholders, usefully challenging and informing decision-making in the present through the collaborative construction of plausible imagined futures.

Scenarios and their value to decisions about online education

As Spaniol and Rowland note in their article "Defining scenario", the scenario is one of the most widely used, yet ill-defined tools in the repertoire of scholars and practitioners who work on futures and foresight. Their 2018 analysis of various definitions proposes that scenarios are a systematized set

of comparatively different narrative descriptions about their users' external context, future oriented and plausibly possible.[12]

Scenario planning originated in the early days of the Cold War with nuclear wargaming pioneered at the RAND Corporation and Hudson Institute by Herman Kahn and others. Realising that nuclear conflict was unprecedented, and strategies could therefore not be developed by analogy to previous military experience, Kahn began devising imagined futures to sharpen leaders' thinking and highlight the implications of strategic choices. In 1967, Kahn and Wiener defined scenarios as "attempts to describe in some detail a hypothetical sequence of events that could lead plausibly to the situation envisaged [...] Some scenarios may explore and emphasize an element of a larger problem [...] Other scenarios can be used to produce, perhaps in impressionistic tones, the future development of the world as a whole, a culture, a nation, or some group or class."[13]

Scenarios were subsequently developed as a tool for use in corporate strategy, notably by Pierre Wack and his colleagues at Royal Dutch Shell. Wack's work inaugurated a tradition of scenario planning - "Intuitive Logics" - which eschewed preferred or probable futures in preference for the creation of plausible imagined futures which enabled decisionmakers to reperceive their strategic situation.[14] As Ramírez and Wilkinson put it, scenario planning in this tradition "invites explicit consideration and contrast of alternative future possibilities to frame and reframe a situation", through rehearsing actions in different future contexts, or reflecting back from each imagined future as a vantage point to appreciate implications for decisions today.[15] As Burt and Nair have argued, the benefits of such reperception may consist not just of what is learned, but what is unlearned in the process: "letting go or relaxing the rigidities of previously held assumptions and beliefs, rather than forgetting them, as part of the general approach to creating strategic foresight."[16]

In a field such as online education, it is difficult to predict with confidence how technology might develop, and at what pace. Should those of us planning for the future of teaching and learning consider holograms? Implants? Novel applications of machine learning? A complete transition from physical to digital learning spaces? Even if we knew on which technological developments to focus, the future of education will depend as much on how such technologies are employed as the new technical capabilities they offer: consider how the arrival of the smartphone transformed the personal transportation market by enabling the creation of ride-share services.[17]

Instead, scenario planning in the Intuitive Logics tradition invites participants to explore futures on the basis of plausibility, seeking those futures which challenge current assumptions in ways which are strategically useful.[18] In the Oxford Scenario Planning Approach, an Intuitive Logics method used in the case study below, a distinction is drawn between the transactional environment - the immediate business environment in which a client operates, and which the client can influence through interaction with the other entities that populate it - and the contextual environment which lies beyond a client's direct or indirect influence. Factors from the contextual environment are juxtaposed in order to imagine future transactional environments - that is to say, scenarios - which enable the challenging of current strategic assumptions and the reframing of the present situation.[19]

In the next section, we will explore the application of scenario planning to questions of online education through a project conducted for the University of Oslo on the eve of the COVID-19 outbreak.

"SCHOOLS AND/OR SCREENS": THE OSLO EXAMPLE

The "Schools and/or screens" scenario project was convened in late 2019 by University of Oslo researchers working on two projects, the "Screen Cultures" initiative and "Living the Nordic Model"; these respectively aim to challenge the routine ways in which people make sense of screen-based

technologies, and to understand the lived implementation of the Nordic model in child-raising by families and institutions.[20] The aim was to bring together stakeholders from across the Norwegian education sector to engage them with the university's projects, and to jointly discover new and emerging focal points for research into the digitalization of education.

The Scenario Building Process

Participants were recruited for a one day workshop which took place on 28th October 2019. Attendees included schoolteachers, researchers from across the university's education and media departments, and representatives of educational nonprofit organizations and tech companies, plus Norwegian government bodies including the Directorate for Education and Training and Kulturtanken, the agency responsible for school students' art and culture provision.

Scenarios were focussed on a typical Norwegian headteacher as "client", regarding them as the principal decisionmakers with regard to what technology was used within their schools and a key figure in terms of the direct relationships held with children and their carers as well as a wide range of institutions including unions, government bodies, the media, and technology suppliers. The scenarios produced would reflect potential future transactional environments for this client, with key uncertainties drawn from a map of those contextual forces which lay beyond the headteacher's control to directly or indirectly influence.

These uncertainties were used to structure three scenarios, iterated twice in the workshop and then subsequently online by a core group from within the university. A time horizon of thirty years was selected as the appropriate distance from which to appreciate how emergent change in the present might play out over time. Finally, the core university team were joined by an external respondent from Western Sydney University's Young and Resilient Research Centre to provide additional commentary on the finished scenario document, which was presented in March 2020.

Three Visions of the Future

The process yielded three scenarios for the future of education in Norway: "The Child Who Had To Grow Up", "Norway Prime", and "Make Norway Great Again." Each offered its own challenges to expectations and assumptions about the future of digitalized teaching and learning.

In "Child", children and young people largely self-educated, working with autonomous or semi-autonomous software agents in powerful and responsive virtual environments. The role of teacher had been ceded entirely to digital resources and schools were no more, replaced by an institution more like a library equipped with advanced tactile, visual, and telepresence technology. The focus on self-directed learning and education through playful exploration meant that young people achieved independence at an earlier age, and also employed digital telecommunications in their informal social and emotional learning. The line between adulthood and childhood blurred as greater responsibilities and freedoms within digital space were given at an ever younger age.

In "Norway Prime", a heavily-surveilled corporate-dominated future saw families trade privacy for comfort. Education, along with other public and domestic utilities and luxuries, was bundled with employment and teaching was tailored to produce the next generation of knowledge workers. Health became a key battleground in this scenario, as algorithmic monitoring systems sought to police the ways in which parents and carers looked after their children. Parents fought back against these systems, insisting that they knew what was best for their child's health and wellbeing. These battles ranged from "arguing with the algorithm" over when a child should wipe their runny nose for themselves to breakouts of Munchausen's Syndrome By Proxy, where parents exerted an extreme and perverse notion of care in order to defy the claustrophobic system within which they lived.

Finally, in "Make Norway Great Again", economic mismanagement and an unexpectedly fast global abandonment of fossil fuels depleted Norway's sovereign wealth fund, crippled its economy, and sent the nation into spiralling decline, leading to a "rustbelt future". Digital technology lagged relative to the rest of the world and tech investment by an increasingly authoritarian government focussed on security & law enforcement. Teachers and schools as we currently know them still existed in this world, but their role had expanded to include forms of social work - guided by digital apps - which were considered necessary to maintain cohesion in an increasingly riven society.

Each scenario stretched received notions of what might await Norway in terms of the digitalisation of education. Such received notions find expressions in official reports such as the Norwegian government's NOU series, which under titles such as "The School of the Future" confine themselves to questions framed by the status quo, such as the content of the future school curriculum.[21] These scenarios offered plausible new business environments within which education might have to take place, going beyond technical considerations to unfurrow assumptions about the robustness of the Norwegian social model, the stability of current notions of childhood, the managed decline of Norway's oil wealth, and the longevity of schools themselves as a social institutions.

In "Child", educational institutions had become "teacherless" through digitalisation and the nature of adolescence had shifted from our time. In "Norway Prime", health was the battleground between a privatised education sector and children's carers, acting in defiance of the authorities. In the authoritarian future of "Make Norway Great Again", teachers' role, however unpalatable it was to our participants, was more clearly defined - and closer in resemblance to that of today - than in other scenarios.

2050 comes to 2020

The scenarios were completed at the end of February 2020 and published early the following month. Norway had detected its first case of COVID-19 on February 26, 2020.[22] Almost immediately, challenges which the scenario process had explored in the imagined far future began to appear in the present.

The vision of 2050 in the scenario of "Norway Prime" highlighted that the battle between parents and institutions over the right to define and determine children's health and wellbeing could be a key tension of the digitalised era. Now, within days of the document's publication, parents who disagreed with the City of Oslo's decision to keep children in school during the pandemic were using Facebook to organise and lobby the authorities, taking two warring conceptions of what was best for school students' health into the digital realm.[23] Once Oslo's schools did close, the new circumstances - with parents and teachers negotiating the content and form of education under the additional pressures of lockdown, in the superficially "welcome" environment of the child's home, via the medium of Microsoft's Teams platform - resonated with the insights of "Norway Prime."[24]

Other scenarios also had light to shed on the circumstances which were emerging. In particular, the vision of a post-oil collapse in "Make Norway Great Again" had been challenging to workshop participants confident in the plans for a managed long-term decline in Norway's oil production and wealth; yet by May 2020, the pandemic had caused the economy's most severe ever peacetime economic setback, leading Norway to break a self-imposed cap on spending from its oil-generated sovereign wealth fund for the first time in more than a decade.[25] Like inhabitants of the "Make Norway Great Again" scenario, Norwegians in the pandemic were confronted with a less comfortable answer than usual to the question: how long will your oil riches last?[26]

It is not that these issues were entirely unpredictable or unimaginable - but nor were "surprises" like 9/11, Brexit, the global financial crisis, or a global pandemic. Rather, the aim of the scenarios had

been to bring these issues within the strategic frame of decisionmakers, using 2050 as a means to stretch their sense of what might await them in the present, and moving decisions around online education from the operational to the long-term and truly strategic.

The greatest challenge faced by the project was the pace at which COVID-19 disrupted the practice of teaching and learning. Even though key features of the scenarios had stretched expectations around the future business context for digitalized schooling in Norway, the swift arrival and impact of the coronavirus meant that it was hard to implement strategy based on the scenarios, as organizations moved into a more reactive mode. By the end of March 2020, adaptations were proposed to the Oxford Scenario Planning Approach to address the particular challenges of the pandemic and the exponential acceleration of change in many domains.[27]

CONCLUSION

When the future refuses to behave like the past, knowing what to plan for becomes increasingly difficult. The complex nature of online education as a technical, institutional, and social practice requires planning and foresight methods which are suitable for coping with significant uncertainties in the future business environment, at a strategic as well as operational level.

Edtech companies, higher education institutions, staff, unions, students, and their families will all perceive, from their different perspectives, the high stakes and lasting consequences involved in decisions about the form which online teaching takes. Under such circumstances, it is valuable for all those involved in online education to come together and construct scenarios jointly.

Scenario building creates an opportunity for those teaching in a time of change to challenge the modelled futures of others, as well as their own assumptions, hopes, and fears about what will transpire. This work can help us to find surprising futures which previous lay in our blindspots, not only highlighting emerging factors in the present, but also providing a safely remote "imaginary" context in which challenging concepts and feelings can be expressed.

NOTES

[1] Martin Sandbu, "Coronavirus: the moment for helicopter money", *Financial Times*, March 10, 2021, accessed 29 May, 2021, https://www.ft.com/content/abd6bbd0-6a9f-11ea-800d-da70cff6e4d3.

[2] Rafael Ramírez and Angela Wilkinson, *Strategic Reframing: The Oxford Scenario Planning Approach* (Oxford: Oxford University Press, 2016), 221.

[3] Rafael Ramírez and Jerome Ravetz, "Feral futures: Zen and aesthetics", *Futures* 43 (2011), 478-487.

[4] H.W.J. Rittel and M.M. Webber, "Dilemmas in a general theory of planning", *Policy Sciences* 4 (1973), 155-169.

[5] Keith Grint, "Wicked Problems and Clumsy Solutions", *Clinical Leader* 1 (2008), 55.

[6] Ramírez and Ravetz, 479.

[7] In 2002, Rumsfeld stated at a press briefing: "There are known knowns. There are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. There are things we do not know we don't know." See "February 12, 2002 Defense Department Briefing", C-SPAN, accessed 10 March, 2021, https://www.c-span.org/video/?168646-1/defense-department-briefing.

[8] Ramírez and Ravetz, 479.

[9] Ramírez and Ravetz, 480.

[10] Claudio Ciborra, *The Labyrinths of Information: Challenging the Wisdom of Systems* (Oxford: Oxford University Press, 2002), 2-3.

[11] Ciborra, 2.

[12] Matthew J. Spaniol and Nicholas J. Rowland, "Defining scenario", *Futures Foresight Science* 1 (2019), e3. doi: 10.1002/ffo2.3.

[13] Herman Kahn and Anthony J. Wiener, "The use of scenarios", The Hudson Institute, accessed 10 March, 2021, https://www.hudson.org/research/2214-the-use-of-scenarios.

[14] Spaniol and Rowland. See also Pierre Wack, "Shooting the Rapids", *Harvard Business Review,* March 10, 2021, accessed 29 May, 2021. https://hbr.org/1985/11/scenarios-shooting-the-rapids.

[15] Ramírez and Wilkinson, 27.

[16] George Burt and Anup Karath Nair, "Rigidities of imagination in scenario planning: strategic foresight through 'unlearning'", *Technological Forecasting and Social Change* 153 (2020), 12.

[17] See, for example, Walter Skok and Samantha Baker, "Evaluating the impact of Uber on London's taxi service: a strategic review" *Knowledge & Process Management* 26 (2019), 3-9. The authors highlight that Uber's success in London did not solely derive from app technology - as other similar services failed to prosper in the same market - but also from its original business model; they also note that despite the pervasiveness of apps, the city's transport regulator has failed to avail themselves of the same technology to track drivers and improve safety.

[18] On plausibility, see Ricarda Schmidt-Scheele, *The Plausibility of Future Scenarios: Conceptualising an Unexplored Criterion in Scenario Planning* (Bielefeld: transcript Verlag, 2020).

[19] Ramírez and Wilkinson, 128-132.

[20] See "Screen Cultures Research", University of Oslo, accessed 10 March, 2021, https://www.hf.uio.no/english/research/strategic-research-areas/screen-cultures/research/index.html and "Living the Nordic Model", University of Oslo, accessed 10 March, 2021, https://www.uio.no/english/research/strategic-research-areas/nordic/research/research-groups/living-the-nordic-model/.

[21] "NOU 2015: 8 The School of the Future - Renewal of subjects and competences", Ministry of Education and Research, accessed 23 March, 2021, https://www.regjeringen.no/en/dokumenter/nou-2015-8/id2417001/.

[22] Reuters, "Norway detects its first case of coronavirus", February 26, 2020, accessed 12 March, 2021, https://www.reuters.com/article/us-china-health-norway/norway-detects-its-first-case-of-coronavirus-idUSKCN20K31G.

[23] Ingrid Hovda Storaas, "Holder barna hjemme fra skolen: – Har et kollektivt ansvar for å begrense spredningen", *Verdens Gang*, March 12, 2020, accessed 29 May, 2021, https://www.vg.no/nyheter/innenriks/i/b52er5/holder-barna-hjemme-fra-skolen-har-et-kollektivt-ansvar-for-aa-begrense-spredningen.

[24] For more on this scenario and its relationship to the COVID-19 outbreak, see Matt Finch and Steffen Krüger, "2050 was last year", *Times of COVID-19*, December 16, 2020, accessed 12 March, 2021. https://timesofcovid19.temporalities.no/2020/12/16/2050-was-last-year-matt-finch-steffen-kruger/.

[25] Reuters, "Norway shatters wealth fund spending cap amid pandemic", May 12, 2020, accessed 12 March, 2021, https://www.reuters.com/article/us-health-coronavirus-norway-budget-idUSKBN22O1IR?taid=5ebaa9a13e01670001c545a4.

[26] See "Why every Norwegian ecowarrior has 200,000 petrodollars", *The Economist*, February 8, 2020, accessed 12 March, 2021, https://www.economist.com/europe/2020/02/08/why-every-norwegian-ecowarrior-has-200000-petrodollars.

[27] See Rafael Ramírez and Trudi Lang, "The Oxford Scenario Planning Approach in the era of COVID-19", Saïd Business School, accessed 12 March, 2021, https://www.sbs.ox.ac.uk/oxford-answers/oxford-scenario-planning-approach-era-covid-19 and Trudi Lang and Rafael Ramírez, "Tending the lily pond: Exponential growth and scenario planning", Saïd Business School, accessed 12 March, 2021, https://www.sbs.ox.ac.uk/oxford-answers/tending-lily-pond-exponential-growth-and-scenario-planning.

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DEVELOPING PARTNERSHIPS DURING TIMES OF CHANGE THROUGH COLLECTIVE IMPACT

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INTRODUCTION

A project to support community college faculty in their transition to online instruction during COVID-19 led to partnerships with local colleges and national organizations to serve the needs of faculty and staff who serve a broad spectrum of students. Centering around the delivery of coaching services to support course design and curriculum transition was the focus of this project and resulted in the combination of instructional design skills and leadership development experience allowing researchers to engage with community college leaders state-wide. Online instruction, under normal operating procedures, requires extensive preparation, time, and access to virtual technology for both faculty and students. [1] This project gave inside perspectives of how instructors, during this Rapid Online Teaching and Learning (ROTL) transition, addressed student engagement to content, peers, and the instructor; additionally, how faculty helped students overcome barriers and distractions due to increased personal work-life pressures during COVID-19. [2]

Support for transitioning seated courses to a virtual platform and solutions to reduce the workload associated with transitioning courses to an online format in a small window of time was provided. User-friendly tools were introduced through one-on-one coaching sessions, webinars, and recorded instructional videos. The project led to state-wide partnerships with North Carolina community colleges, services were provided to 56 of the state's 58 community colleges. To advance the mission of the project, The North Carolina Community College System Office reached out for support and became a valued stakeholder as services were delivered. The project gained attention from the National Institute for Staff and Organizational Development (NISOD) who extended an invitation to present on a national level. This presentation provided a connection on a greater level to serve community colleges during COVID-19 and resulted in a partnership connecting university students working at community colleges with access to resources offered by the organization[3].

COMMUNITY COLLEGES IN THE UNITED STATES

Community colleges across the United States serve students at all levels. From the innovative middle college and early college programs serving as a bridge between secondary and postsecondary education to transfer degree studies, community colleges offer education through the baccalaureate degree. [4] U.S. Community colleges are widely known for their open access, where all students who apply are accepted; however, based on test scores, students may take developmental math or language

courses prior to starting the degree coursework. Students in community colleges typically go into one of two paths, a two-year degree, certificate, or coursework that gives skills needed to enter the workforce or a two-year degree that is transferable to a four-year university where students enter in their third year of undergraduate study. Within the United States, community colleges are also called junior colleges, technical colleges, vocational schools, or two-year colleges. Around the world, higher education is structured in a plethora of ways and many countries may not have community colleges by name but may have similar structures or institutions with similar goals. [5]

Collective Impact Collaboration

Several partnerships came together to support the project of helping community college faculty get their courses online, connect with their students, support their students, and help their students navigate through the semesters during the pandemic. Various elements collectively conceptualized the project – as illustrated in Figure 1.
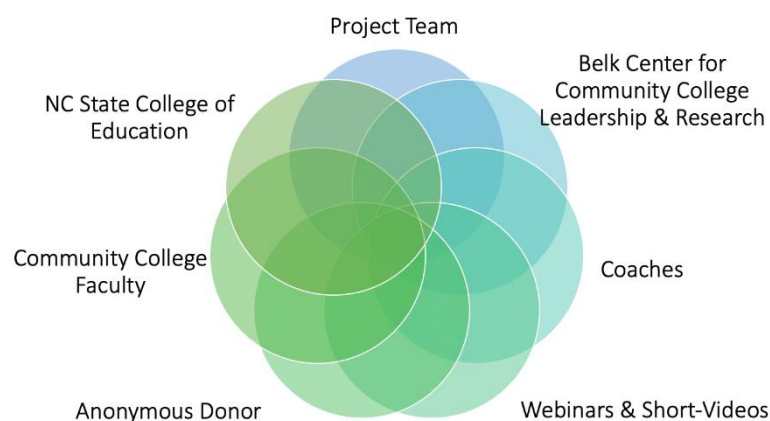
Figure 1. Collective Impact Elements

Project Team

Two faculty members from a Research one four-year university, North Carolina State University, started the program by creating a one-page reference guide with links to resources and videos that would be helpful to someone new to online teaching in getting started quickly. The two created and delivered a free webinar focused on the process of transitioning online quickly. Prior to the events, the expected attendance was uncertain; however, the outcome to assist community college colleagues as they transitioned their courses from seated to online remained the goal. Approximately two-hundred people attended three initial webinars. As a result, the project team created and scheduled additional webinars focused on various topics such as e-advising, low bandwidth course design, and active online learning. A project coordinator was added, in order to help pair coaches with faculty based on experience and availability.

Partners and Contribution

The Belk Center for Community College Leadership and Research set out to help with responding to the pandemic and assisting the fifty-eight community colleges within the state of North Carolina. The project was just one area of the efforts from the Belk Center. Leadership from North Carolina State University also was supportive and remained a valuable partner throughout the project. The coaches initially joined the effort as volunteers and were ready to dedicate their time, talent, and resources to

help the faculty get their courses online. In the end, we were able to provide small amounts of financial support to the coaches for their time. While all the partners were valuable, the most unforgettable partnership during the project was with the community college faculty. Faculty were unwavering in their student-centered focus and working with them left us in awe of their determination, dedication, and hard work. Often working twenty or more additional hours a week to learn online teaching skills and helping their students navigate the online classroom while both faculty and students were dealing with the extra demands of children learning from home, extended work hours, financial strains, access to technology devices and internet, health issues, housing, and food security. These faculty were leading while learning, teaching while lifting, and remaining steady for others while sometimes dealing with unsteady situations themselves.

Webinars

Webinars were first designed to support the quick transition from face-to-face instruction to online. Initially, we were not sure if anyone would show up to the first webinar but we knew we could help if help was needed. Attendance at the first webinar made it apparent that faculty were interested in getting assistance for the shift online.

'How-to' from Technical Online Advice to Learning to Pause, Rest, & Refocus

Webinar topics started out with a condensed, 'to-the-point' overview of shifting content from in-person to online quickly to align with the time pressure faculty faced with only have a short time to get their content online. It quickly became apparent that these amazing faculty were having to comfort their students and teach students how to navigate online classrooms, content, and deliverables who were new to online learning at the same time as the faculty themselves were new to online teaching. It became important to help them pause, rest for a moment, and refocus to understand that it was acceptable to not worry about the bells and whistles of a beautiful online class that was developed with the time, attention, and resources not afforded in the Spring of 2020 semester. Instructors needed to focus on what are the learning objectives. What do students really need to learn in this course? What content, assignments, and assessments will aid in that learning, and the rest is not really needed. Faculty needed to be reassured that offering flexibility for their students did not lessen the rigor of the course.

Partnerships from Webinars

An anonymous donor took notice that the webinars were widely attended and beyond the impact was the apparent need for assistance for these dedicated faculty that worked tirelessly to ensure their students continued learning. Partnerships such as an anonymous gift from a donor, support from the North Carolina State University College of Education Dean, and the leadership team from the Belk Center for Community College Leadership and Research were vital in the ability to take the passion and knowledge to the community college faculty in North Carolina. These partnerships still remain today and the ripple effect from their support is immeasurable.

Coaching

Webinars were well attended and the reach was good in a large group setting. However, some faculty needed hands-on help. We needed more people helping to be able to connect with the faculty. Some faculty needed an extra set of eyes and hands. These particular faculty were experienced with online teaching and while they had not prepped this particular semester to teach online, they knew how.

Their biggest hurdle was not having the time needed to get their content online. Coaches helped them get quizzes online, placed content in the online classroom, and other tasks that the faculty member did not have time to do alone in the one to two weeks given to have the course transitioned from face to face to online. Other faculty, however, had never taught online and they needed assistance from coaches on how to access the grade book, how to get content online, how to record online lectures, how to build an online quiz, and so forth. The coaching program was started to get more hands in the transition whether it was to assist a seasoned online instructor or a first-time online instructor and everyone in between.

Math 101 Versus Truck Driving

Beyond the comfort and experience level of faculty teaching online, the content they were teaching made a large difference in the role of the coach. Helping an instructor get their math class online was about time transferring content into the online space. Understandably, it was quite a different problem when the course was a cooking class or a truck driving program in which students needed hands-on or laboratory spaces to sharpen new skills and demonstrate knowledge growth. Faculty who taught subjects that needed hands-on learning was able to look at the curriculum and decide what pieces could be taught online such as completing a safety inspection, saving other things such as experience hours using a machine for after the pandemic. There were some programs that were able to bring in the use of videos and augmented reality so that students could do simulated lab work without the worries of safety hazards in the home. Faculty were innovative and through their persistence were able to create learning experiences that initially were thought to be impossible.

Lasting Coaching Partnerships

Many of the coach and instructor partnerships remain today. Coaches and faculty still check-in with each other although the project officially ended. They share information and ideas with one another to help strengthen teaching and learning for future semesters. One coach took time to create a handbook of all the advice and resources shared that can be used to help faculty beyond the pandemic.

On-Demand Short Videos

Some of the requests were duplicated among the faculty and so short videos were created to maximize the time and effort of the coaches. Videos that would demonstrate a skill could be created and shared among faculty in various disciplines such as how to embed a video in an online course. [6] The subject of the class did not impact the fact that the short video was helpful to various instructors.

Reach of Short Videos

While coaching was limited to North Carolina, just one state within the United States, the short instructional videos were housed on a public YouTube channel affiliated with the university, so instructors around the world could access the information. Short videos were able to be shared via social media, email, and text as needed and the reach went beyond the initial person requesting the information. This was an unintended positive consequence. These short videos are still used in faculty training as faculty are adding to their online courses as they now shift from the initial transition to getting content online to the planned high-quality online course design that comes when you have the time to prepare the online space.

Other Partnerships that Emerged

Faculty turned to one another, across disciplines, and forged partnerships. They shared ideas, newly created content, tips on engaging learners, alcoholic beverage recipes, and student success stories. These faculty turned one another in a time of need and those partnerships remain visible. Throughout the academic year and within the project, instructional designers provided tips and overviews of free technology tools to get science labs online. Social work faculty who had online teaching experience shared advice about online advising with the business school faculty. Cross-disciplinary partnerships emerged and hopefully college administrators will leverage the impact of those collective impact interactions and foster even greater opportunities in the future.

Preparing for Future Disasters

COVID-19 may have had the widest impact on disrupting face-to-face courses; however, many other things have instigated a temporary school closure or remote operations. This pandemic created the need for continuity plans to prepare for situations where face-to-face courses may need to transition online quickly. Recently, a large institution had to shut down their online classes and emails due to a hacker and it took a couple of months to get things back to 'normal'. Institutions in coastal cities have been shut down due to extreme weather conditions such as hurricanes and flooding. It may be helpful for faculty to be prepared for future disruptions. Having a packet that is downloadable with all vital content and assignment information with a plan for disrupted email, internet access, or campus access may be a good starting point.

CONCLUSION

This project was just one small piece of all the ways the community colleges and universities leveraged existing talent to support, assist, and carry their administrators, faculty, and students through the pandemic. As vaccines are increasingly being distributed and schools are slowly and carefully opening back up to the more pre-pandemic operation, we hope that some of the collaborations and lessons learned will carry forward to have positive impacts on the way we construct teaching and learning in the future. Processes and procedures came into question and I hope we ask ourselves 'What are we doing?' and 'Why are we doing it this way?' more often in the future. To challenge ourselves for continual improvement. The world was thrust into change, changes that many would avoid or disapprove of, and saw that online learning can work. High-quality teaching and learning are viable and the reach is worth the effort.

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THE FUTURE OF ARCHITECTURAL EDUCATION AFTER COVID-19: LESSONS FOR EFFECTIVE ONLINE LEARNING ENVIRONMENTS

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INTRODUCTION

By the end of December 2019, a new form of Coronavirus (COVID-19) has emerged and spread quickly across the world posing a global crisis. As a result, the World Health Organization (WHO) declared the COVID-19 epidemic as a pandemic in March 2020. Several countries around the world have decided to immediately close educational facilities as a part of physical distancing rule to avoid transmission.

In Egypt, the government made a decision to close all schools and universities to avoid spreading the virus and to apply remote education systems as an emergency system for carrying out learning tasks without affecting the education plan. For online education to be effective and comprehensive, it should include conceptual, emotional, systematic elements as well as to be supported by appropriate resources.

Since architectural education is an experience-oriented studio environment and requires gathering, the transition to online education had caused different problems. Architectural students utilize studios as a multi-dimensional space where they spend most of their time, developing their design work, communicating with their instructors and peers, discussing and sharing knowledge with peers. For all these reasons, architectural design education and practical-based courses outside the studio setting have been one of the major challenges in architecture schools during the epidemic period.

The paper assumes that online architectural and practical-oriented studio courses can be as successful and beneficial as face-to-face (F2F) physical studio if it is supported by suitable digital tools and encouraged by an appropriate learning environment.

The first section of the paper introduces the concept and components of both traditional (face-to-face) and online (virtual) learning environments. Then, it presents the problems that were associated with online classes and the adaptation of students to the modern virtual studio environment under different restrictions and difficulties caused by the pandemic conditions. The second section, analyses the case that took place at the Department of Architectural Engineering-Pharos University in Alexandria (PUA), Egypt through identifying the main findings of a survey that focused on the concepts and opinions of architectural students regarding practical-oriented studio courses that were delivered by distance education techniques through COVID-19 epidemic. The survey contains a number of

questions about architectural department students' perspectives concerning practical courses in physical and online studio environments, as well as their evaluations of the modern and digital methods and teaching approaches used, their shifting attitudes and routines and how they deal with the challenges they encounter in the online learning process.

The paper aims at studying the fundamentals of online classes in terms of organizing the future of architectural education processes, strategies and methods to reach effective online learning environments.

FACE-TO-FACE VERSUS ONLINE STUDIOS
Face-to-face studio (Conventional)

The architectural students' primary activity is the design studio. Thus, the design is the most crucial step in architectural education. The studio of practical-based courses is described as "the setting where students learn different methods of architectural design and execution drawings that enhance their creativity through training and learning by doing". The practical studio courses are the core of architectural education and they are where students integrate theoretical and practical skills in prior courses that combines with professional learning activities. Furthermore, the practical class is a social learning atmosphere, in which teachers and learners engage in a physical space within the scope of the studio. Hence, the students learn from both the teacher and from one another.[1]

Schon (1987), defines the practical-based studio as "a reflective realistic approach in which the learner joins a simulated environment established by the teacher with its own limits and guidelines and learns how to create by doing with little risk under supervision".[2] It is a sophisticated system, but the instructor's supervision and guidance help the student to solve the challenges of that complicated coordination. This type of teaching and educating generally necessitates a strong interaction between the instructor and the learner.

Face-to-face (F2F) studio is a pedagogical technique in which both students and teachers are present and dynamically participate in the learning and teaching processes and activities in the classroom environment. This implies that, face-to-face studio are completely engaged intellectually, physically, socially, emotionally, interactively, … etc. more than distance learning.[3]

At a physical space, the conventional studio enables a strong interaction between participants. It is typically a flexible space that can accommodate different tasks including lectures, seminars, one-to-one critics and group or individual work.[4]

In 2020, the COVID-19 epidemic has been difficult, but in the meantime an encouraging period for architectural education to move from traditional studios to online learning environments. Architectural practical-based studio courses have been affected by the changing conditions of contact and social relationships (Figure 1).
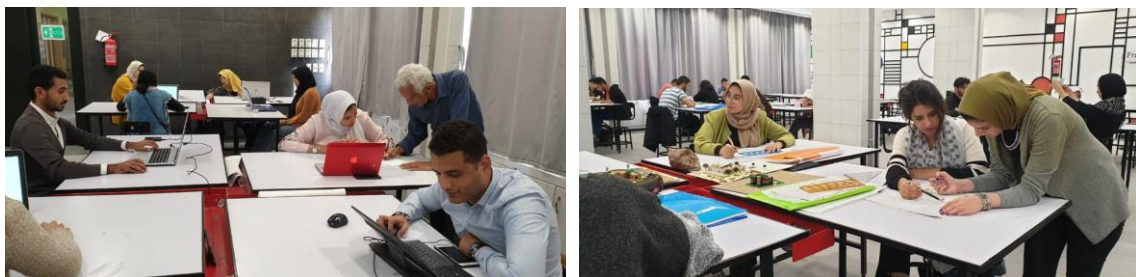

Figure 1. During face-to-face (F2F) design studio in Pharos University in Alexandria (PUA), Egypt

The attributes that characterize the traditional design studio and practical-oriented courses include certain limitations that have an effect on students as professionals. The following are some of the most notable characteristics of face-to-face (F2F) studio:

- **The physical environment limits the students' learning ability**

Students study face-to-face in a conventional studio which serves as an educational and social center for learners due to that all learning tasks are structured around this physical space. As a result, students' interaction with the outside world (architectural firms, universities, companies and businesses) is secondary and occasional. Architectural students spend their time together from four to six years, in the same class and in the same building. Thus, they become disconnected from the general public they would be serving.

- **The design process is developed mainly on a one-to-one basis**

In a conventional design studio, the individual work takes priority over the group work since interaction between students and instructors is limited to certain situations such as informal group reviews and formal presentations. Individualism stems from the professional realm of design, where architects and designers are allowed to consider themselves as artists.

- **The instructor's influence on students restricts their design ability**

Instead of supporting students' development, instructors sometimes tend to put their own interests and desires. In these cases, the relation between the instructor and the students suffers because of the level of understanding between the two parties becomes unclear and inconsistent.[5]

- **The learning activities are not conducted in the real-world professional setting**

Students' education in practical-based courses generally and in the design studio particularly differs from the professional practice since significant topics related to finances, codes of practice and marketing are neglected. In general, the architectural design studio is more concerned with explaining and resolving hypothetical issues instead of expressing real and practical architectural problems. Students rarely participate in group events with real professionals resulting in a distorted perception of professional reality that can only be fixed if learning is considered as an open and participatory process.[3]

Online Design Studio (Virtual)

In the last two decades, distance learning in the design studio and practical courses has emerged providing a learning environment in which students as well as instructors may collaborate and engage with each other regardless location or time. Online design studio can be defined as utilizing electronic technologies to access the educational content outside the traditional classroom and it is an alternative to the problem of space. It may be assumed that this problem of physical space allocation does not exist in online design studio because teaching and learning via distance learning does not require classroom space instead relies on the Internet which could be accessed at any time and from anywhere.[6]

The online environment is employed as a work and communication platform creating connections which result in an evolutionary system that is powered by sharing experiences, concepts, opinions and documents. The online studio class is transformed to a space of knowledge where information is connected to the collaborative reflections made in the virtual space.

The use of online platforms and tools is crucial for overcoming the spatial and time constraints of the studio class as well as promoting diverse modes of engagement during the learning process. This creates a sense of being a part of the learning community because it allows virtual interaction with peers and tutors.[3]

The use of digital and interactive technologies, to achieve online education processes, has resulted in major changes in the architectural education (introduction to future responsibilities, working procedures and assessment techniques), the learning environment (virtual environment with geographically separated groups) and also the students' training time (learning process can happen at any time). The online design studio encourages the progress of interactive and distant projects using asynchronous and synchronous communication methods.[7]

In online education, learning is asynchronous, synchronous or a blend of both (hybrid learning) (Figure 2). In synchronous learning, the student may engage with the teacher and other students in real time, however in asynchronous learning, the student is unable to communicate with the teacher or other students in real time.[8]
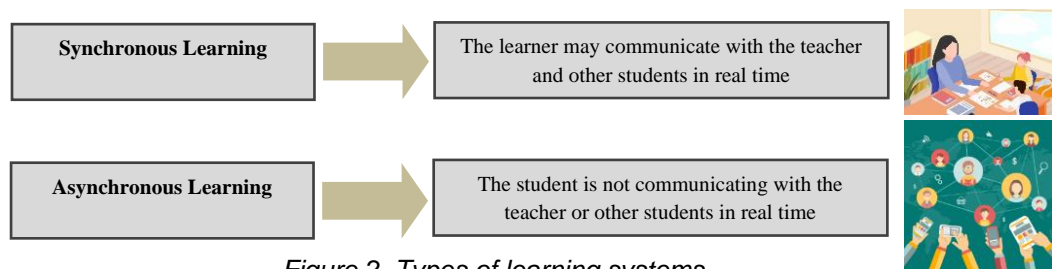
Figure 2. Types of learning systems

These tools allow students to develop a better understanding of newly emerging forms of combined network and application of digital media in the process of design project or execution work. This form of collaborative tool is used in a computer-mediated environment which allows architectural students and staff members to communicate, create and develop using their digital devices. Additionally, this type of environment enables students and instructors to engage with each other's regardless of place or time, to form working groups and to collaborate virtually in the improvement of a project using digital technologies as design support tools.[9] The online practical studio is featured by the following:

• Student motivation, creativity and exploration in the learning process particularly when there is no grading and the studio attendance is optional. The students' inspiration will be derived from his search for knowledge, expertise and learning or by receiving awards at the end of the studio class.

• Mastering the electronic communication methods and procedures for electronic interaction.

• Synchronous contact fosters a sense of presence and teamwork among or between students and instructors.

• The design process becomes more appealing by interaction and socializing between participants (Figure 3).

• The ability to work in free time and the project phasing collaborative learning is promoted not by the dominance criteria or authority.[10]
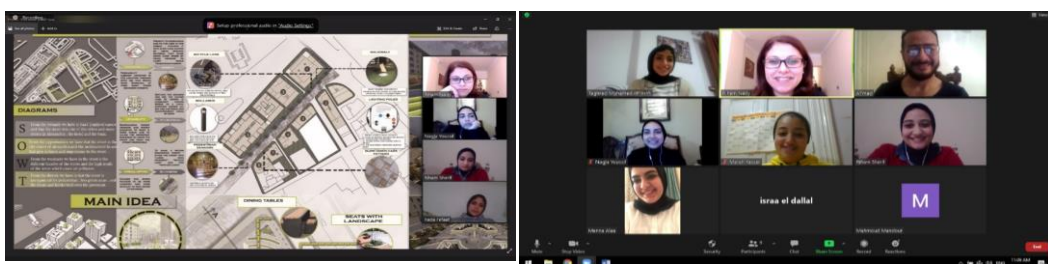
Figure 3. During Zoom meetings discussions and project development

PRACTICAL-ORIENTED STUDIOS ADAPTATIONS TO ONLINE SYSTEM

Architectural design and all practical-oriented studio courses are considered as an active field that emphasis social interaction, collaboration and development. Design and practical-based studio courses are the most basic courses in architectural education that have intensive material in each semester.

In this context, the design studio courses in Pharos University in Alexandria (PUA), Egypt serve as the core of the architectural program consisting of eight courses (two projects in each semester). The design courses start in the first year with architectural drawings, sketches and basic design. These courses seek to introduce students to the fundamental principles that they will face in the field of design and to improve critical thinking and solutions generating skills through two or three-dimensional design problems. From the first studio in the first year (EB143-Engineering Drawing for Architects 1), to the last studio in the fifth year (EA512-Architectural Design Level 8 Graduation Project), students are required to produce creative results to architectural problems at various scales by applying the information and skills they have learned during their architectural education.

The same thing goes for the building technology and execution design courses, the first building class in the first year (EA111-Fundamental Building Construction) to the last working drawing studio in the fourth year (EA422-Excution Design Level 4) where students begin in the first year course with simple basics of building construction till it reaches basic working drawings and applying technical systems in execution design in the advanced years.

Furthermore, there are other practical oriented courses such as Urban Design, Theories of City Planning, Landscape Design, Specifications and Quantities, … etc.

Studio classes, with a tutoring system offer an educational environment in which challenges are explored and solutions are found. In this context, the studio is described as a place based on common interactions and communications where learners experience design, theories, culture and practices throughout their educational practices.

One of the key challenges in the modern distance education-teaching model, is the productive provision of the interactive educational environment based on establishing tutor-system. Due to the fact that the break given to face-to-face (F2F) education under COVID-19 measures coincides with the fourth week of the Spring Semester 2019-2020 and the studio classes have been planned until this time according to face-to-face learning system.

Selection of Online Educational Platforms

Due to the COVID-19 pandemic and social distancing regulations, Pharos University in Alexandria (PUA), Egypt suggested alternative means (through Google Classroom platform) of providing lectures, studio meetings and seminars. In this class, students may share their screens or exchange files or images, discuss criticisms about their projects, chat, broadcast studio and video, upload their work and assignments and engage in interactive online activities. In addition, synchronous lessons were recorded and uploaded by instructors in the virtual online class, which enable students to listen to the recordings after the class time.

Because architectural project education necessitates a method focused on mutual interaction, co-production and sharing due to its nature, some online educational platforms have proven to be occasionally inadequate like Google Classroom. As a result, alternative digital methods and applications such as ZOOM, Skype, Facebook Messenger, Whatsapp, … etc. were employed when technical problems were encountered on the platform used, or during student-teacher meetings outside the class hours.[1]

Throughout the process, the university's technical support department shared instructions, educational videos, tutorials, the fundamental tools of online platforms and documentation for staff members and students on the official website of the university to help them in using the platform.

SURVEY ON STUDENTS' PERCEPTION OF ONLINE STUDIOS

Pandemic was one of the sudden and difficult circumstances that helped to bring the online education process directly after lock-down. During the online education process, there have been several special educational and technical challenges. Due to this unusual educational situation with its problems and opportunities, an analysis of online studio classes was conducted by a survey, which has become the important digital space for architectural students to interact and create work.

The structure of the survey

The survey was conducted among architectural students at the end of the Spring Semester 2019-2020 to investigate their experiences with online design studio and practical-oriented courses in architectural education. The survey sample group included third, fourth and fifth year level students. The survey questionnaire was completed online using Google Forms which is a free online survey tool. It included four sets of questions (Table 1). The first set included 7 questions, that focused on the basic information about the student, while the second set consisted of another 7 questions which dealt with the general experiences through the online studio environment. The third set included 7 questions that focused on the students' abilities to use interactive digital drawing softwares while the fourth set consisted of 4 questions that investigated online studio and the relation between the instructor and the students. An additional set of two questions introduced students to suggest different proposals for online practical-based courses. The survey received 127 responses, with 27 from 3rd year students, 55 from 4th year and 45 from 5th year.

First Set: Basic Information	Number of Students from all levels	
	Yes	No
Level	---	---
Semester	---	---
During COVID-19, did you attend architectural practical classes online (Architectural Design-Execution Design)?	125	2
How frequently did you attend your practical class online?	---	---
What is the most used social media besides the educational platform Blackboard?	---	---
Second Set: Online Studio Environment		
Have you find it practical to attend online architectural practical classes (architectural design and execution design)?	96	31
Did you have the same social environment in online classes as face-to-face classes?	66	61
Are there stated goals and clear purposes for each online class?	106	21
In your point of view, did you gain the same experiences from online architectural practical classes (architectural design and execution design) as face-to-face classes?	67	60
Is online studio experience useful to your future architectural career?	90	37
Have you faced problems and difficulties during online studios?	50	77
If you have faced difficulties, what are they?	---	---
Third Set: Student's Skills		
Did online practical classes, turned the time spent at home into a productive activity?	107	20
Did online studio allowed you to become more self-disciplined and more organized in home environment?	96	31
During the online studio process, did you have the opportunity to improve you CAD, Sketchup, Revit, 3DMax, ... etc.?	101	26
During the online studio process, did you benefit from alternative research methods and digital resources (web resource, e-library, social media, ... etc.)?	112	15
During online classes, did you use different learning strategies (PowerPoint presentations, research, drawn assignments, ... etc.)?	9	118
Did online classes allowed you to realize the ability to adapt to and to be productive under sudden changing conditions?	116	11
In your point of view, do you think students need much training to deal with online studio?	81	46
Fourth Set: Relation with the Instructor and Assistants		
Did you benefit from joining online discussions with your instructor to exchange ideas?	103	24
During online architectural practical classes, did you have an effective support from the staff?	96	31
Did online studio strengthen the sense of belonging to instructors and assistants?	82	45
Do you think instructors and assistants need much training for online classes?	76	51
Fifth Set: Proposed Students' Ideas		
Finally, do you agree to continue with online practical classes?	85	42
In your point of view (as an architecture student), what ideas can be proposed to be done during online architectural practical studios?	---	---

Table 1. The structure of the survey

RESULTS OF STUDENTS' SURVEY

The results gained from the survey were analyzed and assessed. It was observed that, the practical online classes were attended by 47.2% of the students once a week. However, in these 3 levels students should attend three days a week (Figure 4). Also according to the survey, Whatsapp application was the most common alternative communication tool accounting for 89% for being user-friendly although Facebook Messenger was never used.
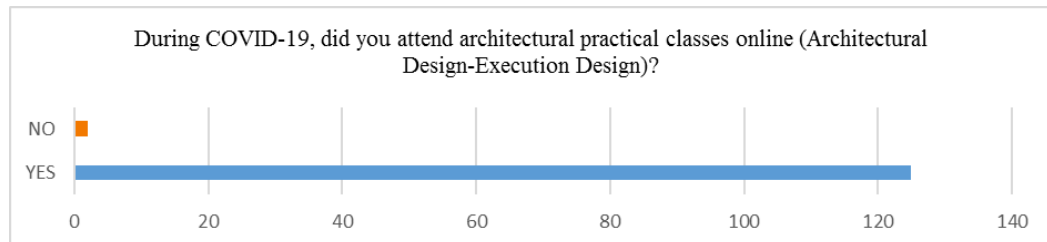
Figure 4. The number of students who attended
online practical oriented-classes weekly

In addition, it was discovered that the students of the 4th and 5th year level found it easy to attend online architectural practical-oriented classes, while students of the 3rd year found it challenging. Nearly half of the students, about 52%, found the same social and communication atmosphere in online classes. Furthermore, 83.5% of them acknowledged that instructors had clearly defined goals and direct objectives for each online lesson. Also, about half of the students gained the same experiences in online architectural practical courses similar to face-to-face lectures. This ensures that half of them felt the same environment as students in traditional classes. Furthermore, 71.9% said that virtual studio experience would help them advance in their future careers as architects. Only 40% of the students faced problems during online classes, where most of the problems related to technical issues such as internet connections, electricity issues and the inability to communicate with staff to provide them with proper track of their projects (Figure 5).
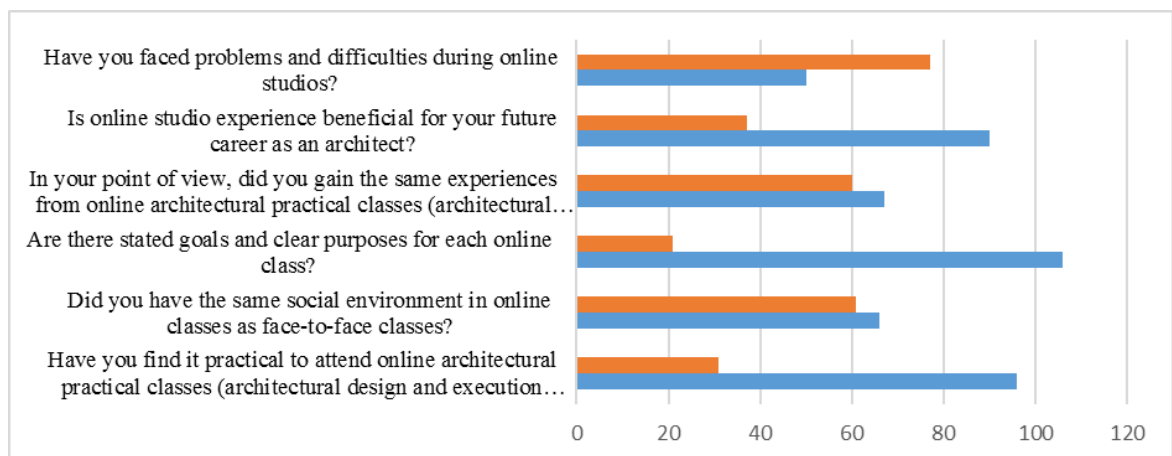
Figure 5. The number of students who faced difficulties
and who benefited from online classes

The third set of questions focused on students' ability to use digital drawings. From 75% to 88% concluded that their time spent at home became productive as they turned to be self-disciplined and

coordinated allowing them to develop their drawing skills and take advantage of digital opportunities in all fields. In addition, 90% of the students said they had the ability to adjust under sudden and rapidly changing conditions, while 63% stated that they needed further experience to cope with online studio classes. In this context, there is a contradiction between their feelings of adaptation and their needs for training (Figure 6).
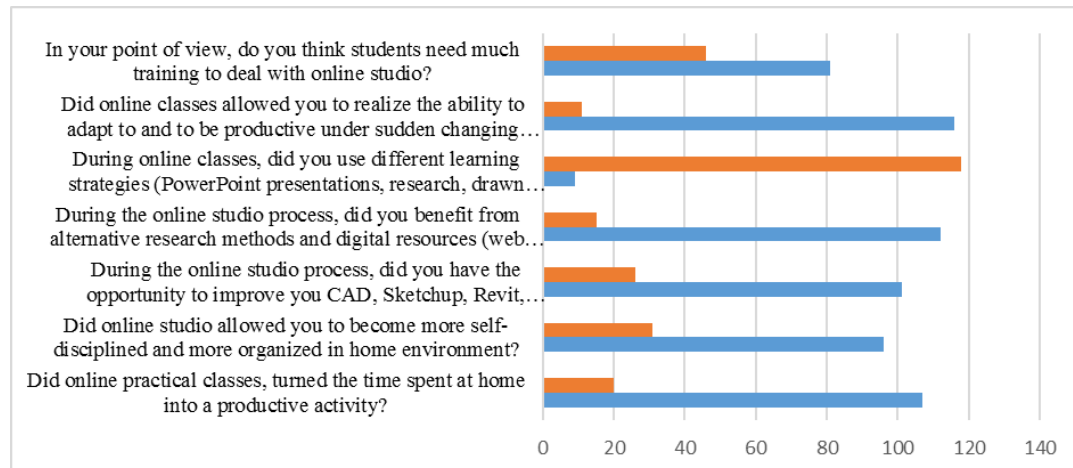
Figure 6. The number of students who developed their architectural skills during online classes

The fourth set of questions investigated the relation between the instructor and the students as well as the used digital platform for socialization and production. The majority of students believed that participating in online discussions with their professors helped them and that their instructors were supportive and gave them a sense of belonging. In addition, it was observed that the staff needs further training in order to deal more professionally and technically with the current educational environment (Figure 7).
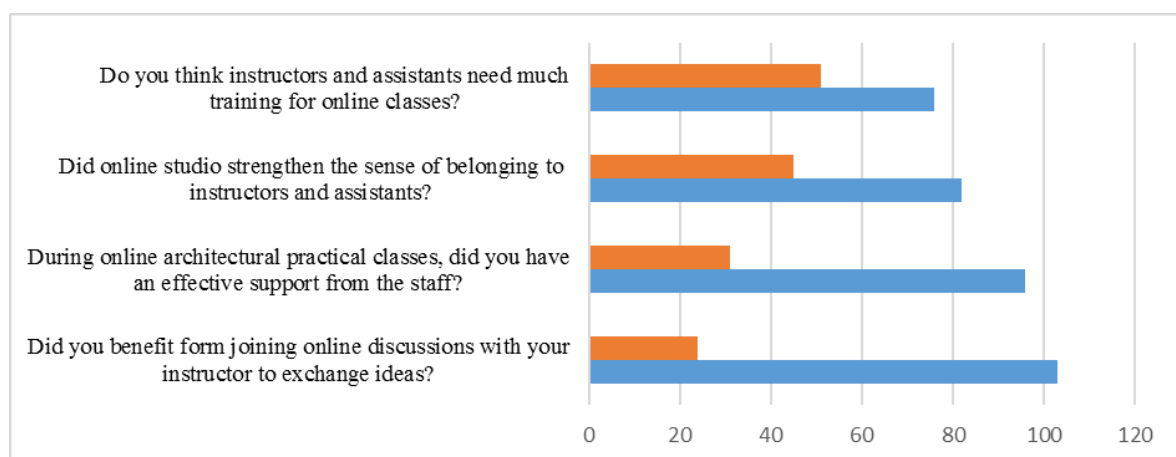
Figure 7. The number of students who benefited from online discussions to develop their work

The fifth set of questions which the significant part, is where the students proposed ideas for developing the online studio courses. It was found that, 66.9% agreed to continue online learning while 33.1% suggested combining between online and face-to-face (F2F) learning (hybrid learning).

According to their opinion, they believed they need to meet with their staff and peers in order to improve and discuss their work. Also, they proposed to make simulated field visits and online meetings with labor market. Most of them, recommended that students should be grouped in small classes of two or three students and one assistant, and have an individual video meeting to discuss their projects and work (Figure 8).
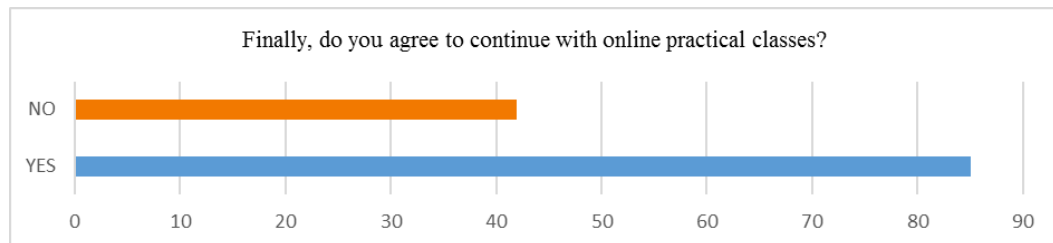
Figure 8. The number of students who agree to continue with online practical-oriented classes

OUTCOMES AND DISCUSSIONS

The survey reveals several important findings about students' perceptions of online architectural practical-oriented classes. Students believe that the most significant advantage of online studios is using digital communication methods such as ZOOM, WhatsApp and others. This is a predicable outcome because although the students already use social media technologies professionally, they are unfamiliar with educational and formal digital communication tools and platforms. Meanwhile, they find it useful to become acquainted with long-distance communication equipments.

Another significant finding indicates a weak side of the traditional physical studio environment (face-to-face). Students believe that being able to replay recordings of the discussions and videos of lectures several times is helpful to them. However, in the conventional studio setting, students have to participate in the discussions between their teachers and classmates, while still working on their own design or execution project. This situation causes them either to forget important facts or remarks, or to interrupt their concentration while they are working. The recording of sessions provided by the online platform helps them to focus on either their work or the discussion and complete the other at a later time without missing any information or comments. This is a significant aspect of distance education that needs to be incorporated into the studio classes even if the studio transforms back to the conventional physical environment.

Also, the study has a significant outcome concerning the physiological impacts of the practical-oriented studios, especially during stressful periods like the pandemic. For design students, the productive activity of solving the design challenge may become a kind of therapy for dealing with real-life issues. Students can create productive environments from their own living spaces, if they have the appropriate resources and the opportunity for self-actualization.

Social interaction and communication are important aspects of the architectural practical studio environment. This fact is clearly expressed in the survey results. Even on online platforms, students believe that the practical studio classes are excellent chance for socializing. Although, the physical studio environment allows for unobstructed and momentary activities easily, the online design studio is a bit weak in this aspect. That might be a promising area for online practical-oriented studios, or an important key for the creation of hybrid studio environment (Table 2).

Strengths	Opportunities
Distance learning in times of pandemic of any natural disasters that needs social distancing	Allows the same environment as conventional face-to-face studio classrooms
Gives the opportunity for students to save their time and to be useful and productive	Allows students and staff to use all digital tools
Relies on online sessions as it can be repeated more than once	Benefits students' future work as architects
Flexibility in delivering education and accessing content and resources	Favours independent learners and more efficient in small groups
Weakness	**Threats**
Technical problems with computers and internet connections	Students miss the site visits and meeting labour market which is an important aspect in the profession of architecture
Not in touch with their instructors and assistants as face-to-face classes	Students lack time management
Declining class attendance	

Table 2. SWOT analysis for practical-oriented online classes

LIMITATIONS

The study provides significant information from the students' perspective in the Department of Architectural Engineering in Pharos University in Alexandria (PUA), Egypt, on how the educational process took place in the context of the pandemic and the information that may be used to enhance the online teaching-learning process. However, the study also has some limitations. One limitation is represented by the fact that the sample was non-probabilistic and the research was conducted only on Pharos University students. Thus, the results cannot be generalized to the entire Egyptian higher education system.

It would be beneficial to expand the sample to include other Egyptian universities and architectural schools, in order to be able to generalize results and also to make comparisons according to universities, fields of study, experience of universities with online learning. Furthermore, it would be useful to conduct a longitudinal study that would allow to investigate how universities adapted to teaching and learning exclusively online, if and how teachers adapted (teaching style, interaction with students), and if students' attitude towards online learning improved.

CONCLUSION

The study focused on many aspects of teaching architecture (particularly practical studio courses) in distance-learning environment due to the COVID-19 pandemic. Both teachers and students had to adapt to the new social conditions and move to online classes, which have become an important alternative to reforming the entire traditional architectural education system. The unplanned shift from conventional in-class to online teaching affected the educational process and the reactions of teachers and students. The teaching process was impacted by technical problems, shortage of training and experience and some physiological conditions resulted from the uncertain situation.

It is clear that online practical-oriented courses presented several obstacles and require enormous efforts of both instructors and students. However, hybrid learning is a viable option for enhancing

studio classes with online technologies, since it combines both conventional and face-to-face (F2F) studios while also allowing for synchronous communication through online sessions.

According to the previous studies, online practical-based studios can have real advantage to teachers and students as it crosses the traditional design studio boundaries, combine conventional design studio with online studio teaching and thereby could improve the architectural practical-oriented classes.

As a result, the benefits of virtual online design studio concept and approach should be demonstrated in the faculties and higher educational institutions. Virtual design courses may be developed in collaboration with the staff members to investigate how it might be integrated into traditional design studio environments and the architectural program while also considering how to overcome the current technical, policy and knowledge-based constraints.

A number of activities that can stimulate and assist the Egyptian education system's transition to this new kind of teaching should be implemented in order to properly and successfully adapt to online studio teaching and learning. In this context, architectural schools might establish teacher training sessions or develop programs whose goal would be to improve teachers' performance and implicitly the quality of the practical-based studios.

Technical difficulties are still the issues most difficult to solve, due to the capacity of the servers owned by universities. Universities have undoubtly made efforts in order to solve these problems and improve the functionality of online platforms. Still, students' technical problems remain poor internet connections, signal loss and lack of adequate digital devices, particularly students who live in rural regions or come from families with low incomes. Architectural schools could develop programs to suit these demands and thus facilitate the practical-based studios for students who find themselves in these situations.

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STOP GRADING YOUR STUDENTS

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INTRODUCTION: THE FIRST LESSON OF TEACHING

The first time I questioned grading was when I made a student cry.

I was a brand-new TA working under the guidance of a tenured professor in my MFA program. It was my first time on the teaching side of a classroom in an official capacity and I was *euphoric*—teaching had been my goal since I was a Sophomore in undergrad, and here I was, helping to lead a classroom of young, eager minds. I burst into the classroom each week with the exuberance of a stage mom during pageant season, ready to give my students the support and advice they needed to become the next design superstars.

At the professor's instruction, and as part of my pedagogical learning, I was tasked with "grading" the students' roughs for a logo design and branding system in an upper division class in the university's BFA Communication Design program. This grade was by no means final, nor was it even going to be recorded by the professor—he just wanted me to understand the process of grading and discuss with him my rationale for the grades that I gave (perhaps my first sign that grades were not as objective as students are led to believe). After arguing my case with him (he said that I was much tougher than he would be—another sign), I handed out the marked projects with all the authority of my professional experience and knowledge I could muster.

Hers was the first judgment to be passed and, by the time I reached the third person, I could hear the beginnings of sniffles coming from her corner of the room. By the end of my route, the sniffles had turned to silent sobs.

I looked, horrified, at the professor, who sagely nodded to take the student outside so that she could have a more private meltdown—to save her from embarrassment, and to allow the other students to continue class as if there wasn't someone openly weeping out in the hallway. I sat her down and asked what was troubling her, my confidence in the grade I had given her (a "D") eroding under the weight of my empathy and concern. I knew this student; I had spent weeks getting to know her and knew her to be smart and tenacious, though a little spacey at times. I also knew that *she* knew she could do better in her work. My intent with the grade was to show her those areas of improvement, to impress upon her the importance of critical thinking and application of her craft and knowledge, and to inspire her to pursue her best work, but in that moment, all I saw was a scared young woman who had reached the end of a very short rope.

We talked about what was going on (concerns that had very little to do with school), how this grade meant nothing, and that she still had time to improve. I told her to focus on the feedback that I had given, not the grade; to set achievable goals for herself and take it one day at a time; and above all,

take care of herself and to reach out to me if she needed any help whatsoever. These sentiments, I realize now, were more prophetic for my current approach to grading—and teaching—than I could have known at the time.

WHY GRADING SUCKS (FOR YOU AND YOUR STUDENTS)

I am fairly new to the concept of "ungrading", having only begun the process of phasing out grades from my courses over the past year and a half. Others, such as Alfie Kohn, Susan D. Blum, Maria Montessori, Ruth Butler, Peter Elbow, Larry Geni, Paulo Freire, and bell hooks (to name just a few), have made the case over and over again against grading as a means to promote and achieve learning. This paper is more of a case study of my own experiments in ungrading, so instead of trying to summarize the entirety of the subject matter, I will try to distill some of the main arguments that have come from my foray into the decades (and in a few cases, century) of work that others have put into the subject and that have most informed my own experiments.

- **Grades are subjective, not uniform.** I mentioned my first inklings of this in the introduction, but it's inarguably true. What, truly, is the difference between a B+ and an A-? How does one quantify abstract concepts like creativity and "uniqueness"? Ask 100 teachers and you'll get 100 answers. A century of research backs this up.[1] That subjectivity ends up creating confusion (and anxiety) for the students more so than critical inquiry. That is because...

- **Grades don't provide any useful information.** A percentage less than 100 only tells a student that their work isn't perfect, not *why*. And how can creative work be "perfect" anyway? Ruth Butler teaches us about fostering intrinsic versus extrinsic motivations in students, encouraging them not through punitive, extrinsic measures (grades), but through feedback that inspires opportunities for improvement and growth (intrinsic motivators). Her research shows that students who receive comments on their work (without grades) consistently outperform students who receive just grades, or receive both grades and comments.[5] Feedback fosters critical thinking and, importantly for design, revision. Laura Gibbs says that "...when you get rid of grades, revision is no longer a reward, and it is no longer a punishment; it's just what you do in order to improve and learn more."[6] It is through this loop of feedback and revision that students confront issues in their work and learn how to resolve them.

- **Grades don't encourage learning.** Kohn sums it up thusly, "*The more their attention is directed to* how well *they're doing, the less engaged they tend to be with* what *they're doing*" (original emphasis).[2] This is backed up by Elbow who states, "Once we start grading their work, students are tempted to study or work for the grade rather than for learning,"[3] and Stommel, who adds that grades are "a currency for a capitalist system that reduces teaching and learning to a mere transaction."[4] Through grades, we are telling our students, "do X, Y, and Z and you'll get an A." There's no room in that system for exploration and experimentation, for inquiry or debate, or for self-actualization and agency. Students aren't learning the content, they're learning how to follow directions blindly and please a particular faculty member.

While that is not the entirety of the arguments against grading, it was enough to get me to change my ways. This paper isn't meant to be theoretical; it's practical—so let's talk about how this actually applies to the design classroom (or any classroom, for that matter).

METHODOLOGY: HOW I DID IT

After reading Starr Stackstein's *Hacking Assessment: 10 Ways to Go Gradeless in a Traditional Grades School*[7] over winter break 2019–2020, I rushed to redesign my entire syllabi and course structures around the idea of ungrading. In hindsight, this was both the most foolhardy and prescient decision I made that entire year.[8]

The first thing I did was to remove any unnecessary grades that had nothing to do with course content: participation, attendance, and even deadlines (though I still kept a course schedule). I then laboriously went through the learning outcomes of each course and created what I thought (at the time) was a rather comprehensive and clear rubric for each individual learning outcome, broken into three levels: Progress, Proficiency, and Mastery.[9] Instead of me assigning grades, I assigned self-assessments for the students to complete after each project. These assessments were based off of Rothstein's and Luz's work, where they argue that "Reflection gives students the opportunity to name for themselves what they are learning, and when they do that, they own the skills more strongly and deepen their understanding of how they can use what they learned in other situations."[10] Because I was (and am) still required to turn in a final grade at the end of the semester, I installed a metric for how to calculate a grade based on the rubric. Below is an excerpt from one of my syllabi for the Spring 2020 semester and the accompanying Mastery Rubric (Figure 1):

Throughout the course, there will be **Self Evaluation Conferences** after each major project to provide feedback and assessment. These will be ungraded, but will provide a review of the student's progress and potential areas of improvement.

There will be one final letter grade determined at the end of the semester through a **Final Evaluation Conference** between the student and the professor. All exercises, assignments, and projects will be utilized as evidence to assess the student's final grade based on a Mastery Scale of the specified Course Learning Outcomes (see the accompanying *Mastery Assessment Metric* and *Grade Breakdown*).

Grade Breakdown

A: Student shows **Mastery** in all learning outcomes.

B: Student shows **Mastery** in most learning outcomes, **Proficiency** in the rest.

C: Student shows at least **Proficiency** in all learning outcomes.

D: Student shows at least **Proficiency** in most learning outcomes, **Progress** in a few.

F: Student shows **Progress** in most learning outcomes.

Mastery Assessment Metric

Learning Outcome	Progress	Proficiency	Mastery
Project Analysis	Ability to comprehend and communicate the objective of a project.	Ability to comprehend and communicate the objective of a project, as well as identify areas of investigation with some prompting.	Ability to initiate own project, comprehend and communicate the objective, and identify insights & areas of further investigation with little to no prompting.
Design Research	Ability to use limited primary and secondary research to address design challenges.	Ability to analyze various primary and secondary research to investigate and address design challenges.	Ability to critically analyze and synthesize a wide variety of primary and secondary research to identify, investigate, and address design challenges.
Sources of Inspiration	Ability to collect some inspirational sources.	Ability to collect and curate a variety of inspirational sources.	Ability to collect, curate, and utilize a wide variety of inspirational sources.
Communicative Sketches	Ability to communicate simple ideas/concepts with sketches.	Ability to utilize design principles to communicate different ideas/concepts with sketches.	Ability to effectively and efficiently utilize a variety of design principles to clearly communicate complex concepts.
Communication of Design Vision Through Mood/Style Boards	Ability to recognize design, tone, and/or personality direction from a mood board.	Ability to collect images to communicate a general direction for design, tone, or personality.	Ability to selectively curate images to clearly communicate a clear vision of design, tone, and personality.
Idea Generation	Ability to explore a few different ideas utilizing some concepting techniques—requires prompting.	Ability to explore multiple and different ideas utilizing a variety of concepting techniques—with some prompting.	Ability to rapidly explore multiple and different ideas utilizing a variety of appropriate concepting techniques—little to no prompting.
Appropriateness of Ideas	Ability to identify appropriate ideas for certain media/output and/or certain audiences.	Ability to identify and develop appropriate ideas for a variety of media/output and for different audiences.	Ability to identify, develop, and evaluate the appropriateness of ideas by critically analyzing media, output, audience, and context.
Design Brief	Ability to recognize important aspects of a design brief.	Ability to analyze an external design brief, and write a self researched design brief.	Ability to craft a clearly communicated and efficient design brief that presents necessary and inspirational information.

Figure 1. Zachary Vernon. "Mastery Rubric," Spring 2020.

On the first day of the semester, I spent a good hour of class going over this new system and answering questions. There were the typical questions I expected: "how will we know how we're doing in the class," and "how will this affect our GPA?" Most of the students seemed hesitantly interested, especially as I focused on the ideas of growth, practice, and learning as the purpose of this new system. I wanted them to understand that messing up in the beginning was an integral part of the learning process, and I didn't want to punish them for experimentation and practice. Some of that got through, as you will see in the feedback from students later.

My assignments and deadlines for the course remained much the same and I used Canvas (our learning management system) to provide feedback to work turned in online. I always have students either scan, photograph, or submit digital files of work so they, and I, have a record of their work. When the time came for their evaluation conferences, I provided them the self-assessment "quiz" through Canvas that asked them to reflect on their work, assess themselves (based on the rubric), and provide evidence of their learning through writing and visuals (see the appendix for samples of these quizzes over three semesters). I then met with each student individually during class time (my two-days-a-week classes required two whole class periods to accommodate upwards of 30 students) for anywhere from 5–10 minutes to go over those assessments, ask questions, and make comments or notes for them on areas of improvement.

At the end of the semester, students filled out their final assessment quizzes, provided their arguments and evidence, and supplied the grade they believed they had earned. On the whole, I agreed with many of their self-assessments. Some had delusions of grandeur (as expected), but many were realistic and surprisingly honest, while some were overly critical and harsh on themselves. We discussed their learning and came to an agreement on their grade based on their evidence and my comments. Overall, the distribution of final grades in my class didn't change all that much from when I had a more traditional grading structure. Most of the students were very self-aware and showed a much higher capacity for metacognition[11] than I had observed in previous classes.

RESULTS AND RESPONSES

From my perspective, the ungrading process in the first two semesters was hit and miss. The assessment quizzes didn't quite capture the information I wanted the students to consider, and the rubrics were still quite clunky in their language and differentiation. Fair warning: providing individualized constructive feedback is incredibly time-consuming. Personally, I have always left copious amounts of feedback for my students, so the only major change to my method of assessment was the removal of grades. I did feel pressure to provide better quality feedback to my students because they didn't have a grade to help give them that idea of "how well" they were doing in class— something they were so used to knowing and calculating. I am still learning how to best provide feedback that clearly relates back to the learning outcomes and rubric language.

On the other hand, the conversations ungrading allowed me to have with students about their learning and how they were applying their knowledge were some of the best discussions I've had with students in my entire teaching career. Students went from asking me what *I* wanted from their work to telling me what *they* wanted. We got to be vulnerable, and talk about our fears and imposter syndrome, about individuality and how to continue to grow. I hadn't felt that exhilarated since I first stepped into that initial classroom as a TA. In addition, the final grade distribution did not change all that much from my traditional grading classes, which I found both surprising and reassuring. Students were mostly honest about their results and efforts, and only rarely would I need to disagree with their self-assessment.

As for the students' perspectives, I think these two comments on my ratemyprofessors page[12] provide a good range of how those initial semesters went (Figure 2).
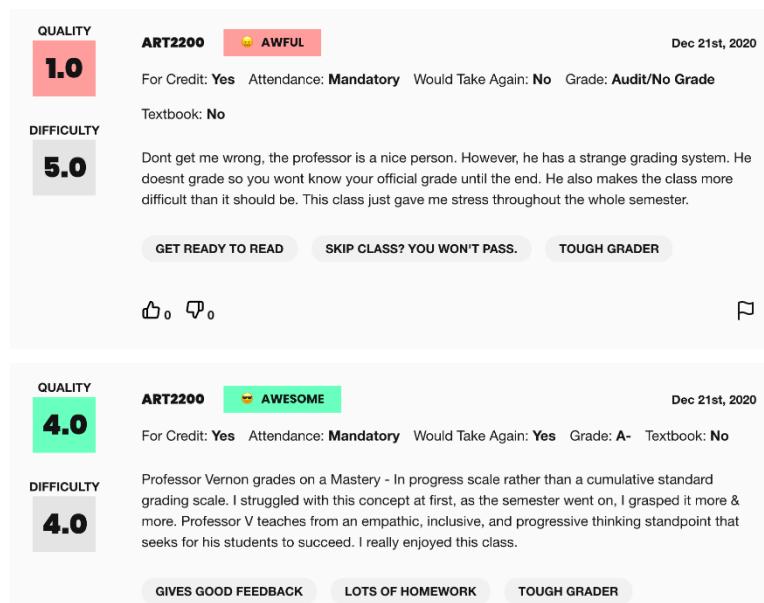
Figure 2. Screenshot of Ratemyprofessors.com student ratings. Accessed April 1, 2021.

Here are a few more quotes from an informal survey I did at the end of the Fall 2020 semester from both of my classes that provide a more detailed picture:

"With traditional grading it's more stressful and with self-evaluation I feel like I get to learn more about myself and my work and how I can further improve. After this class I'm definitely more willing and comfortable to step out of my comfort zone and take risks in my work." —ART 2200 (Concept Development)

"I think it's helpful because it makes you think about yourself and what it is that you're doing. I think that a lot of the times we don't sit back and think about the stuff that we are doing and more rely on others to tell us how we are doing with work. But with this it makes you think and meditate on how you're doing. It allows you some 'time to yourself' and think out loud and look within to see what it is that you want and what you're doing." —ART 4925 (Senior Capstone)

"At the beginning, self-assessment seemed confusing because I felt unaware of what my current standing letter grade was in the class; because that is the norm. However, I did enjoy self-assessment in the end. I had a different, and greater, sense of ownership to the grade as I self-reflected on my progress throughout the semester. Traditional grading often becomes a numbers game, where you can calculate how your grade will be impacted; whereas, self-assessment made me figure out the flaws in my progress & address them throughout [the] course." —ART 4925 (Senior Capstone)

Breaking through the Stockholm Syndrome that our students have with traditional grades takes time and a lot of communication, but in my experience, most come around in the end. They come to see that the goal and product of their education is the knowledge and skills they gain, not a GPA or a piece of paper.

CONCLUSION

Ungrading is an excellent though challenging strategy for re-centering learning in our classrooms. There isn't one single way to go about ungrading, either. Some use a contract method by which individual students and the teacher agree to a level and quality of work that will be accomplished by the end of the course.[13] Others utilize an anarchist's approach to grades, giving the students much more agency in choosing how and what they learn.[14] There really isn't a one-size-fits-all approach, and finding your own way to implement these strategies is part of a personal process that requires— appropriately—your own self-assessment of your methods.

FURTHER RESEARCH

For me, I continue to tinker with the formula. For example, based on several students' feedback I changed the wording of the Mastery Rubric from "Progress, Proficiency, and Mastery" to "Needs Work, Standard, and Strong" in the current iteration of my syllabus. The word "Mastery" had some very powerful connotations that my students—a majority of whom are first-generation college students and Latinx—did not feel comfortable attributing to themselves, even when they clearly demonstrated that level of work.

The next phase of my experiments in ungrading will be to remove rubrics altogether and attempt to change all of my classes to Pass/Fail or Credit/No Credit. Kohn argues that "Even if we have the good sense to strip [rubrics] of numerical ratings, a critical first step to detoxifying them, rubrics are all about evaluation,"[15] and as Susan D. Blum states in the same book, "our principal task is educating all students, not ranking them."[16] I am emboldened by the response from my students to these past experiments in ungrading, as well as the support of mentors and administrators in my department (a rare thing indeed), and will continue to chase away the shadows of "ranking" and "judgement" in order to shine the light on learning and growth. A hokey metaphor for sure, but if enough of us stop grading our students and just focus on teaching them, I believe we can create a brighter future (pun intended).

APPENDIX

1.1 Self-Assessment Quiz #1 from ART 2200, Spring 2020:

1. What was my understanding of the task in my own words?
2. What did I do to achieve success on the task?
3. What challenges did I face and how did I overcome them?
4. Which standards (Progress, Proficiency, or Mastery) did I meet and what evidence from my work supports that assessment? (accompanied by the Mastery Rubric)
5. If I had the opportunity to do it again, what would I do differently?
6. What skills do I think I can improve upon and what are my plans for improving them?
7. What is the most important thing I learned from this experience?
8. What unanswered questions do I still have?

1.2 Self-Assessment Quiz #2 from ART 2200, Spring 2021:

1. **How has your ability to analyze projects grown since the beginning of class?** Reflect on how you approach and understand (design) projects. How has that changed from the beginning of class? What have you learned about analyzing a project's objectives, contexts, and purpose? What do you feel you can do better?

2. **What have you learned about design research since starting this class?** Reflect on how you approached research in the beginning of this class, and how your approach and knowledge of research has changed. Provide specific examples of your growth, including references to different design research methodologies used in your work, insights gained from synthesis and analysis of collected information, and how you communicate those insights. How might you improve in your use of research?

3. **How have you expanded your sources and use of inspiration?** Reflect on your sources of inspiration. How has your seeking, analyzation, organization, and use of inspiration changed from the beginning of this class? What are you currently doing to improve your library of references and use of inspiration in your work?

4. **What have you learned about creating communicative sketches?** Reflect on your presentation of your ideas through sketches over the past projects. How have you changed the way you view your sketches? How have you changed the way you present your sketches and communicate your intent? Show specific examples of your growth, and/or reflect on areas of further improvement.

5. **What have you learned about creating and using mood/style boards?** Reflect on your mood boards from class. How have you improved in your ability to communicate your artistic vision: your aesthetic direction as well as personality/tone of voice for your work? Provide specific examples of your growth, and/or where you can continue to improve.

6. **How has your ability to generate ideas changed since the beginning of class?** Reflect on your creative process. What have you learned, and how have you applied that learning to expand your ability to generate a wide range and quantity of ideas for a single project? Provide examples of your growth, including references to specific techniques you use, or other ways in which you explore conceptual thinking.

7. **What have you learned about writing a design brief?** Reflect on the design brief you've written, as well as the briefs you've read and the readings/videos on creative briefs. What aspects of a design brief do you feel you excel at writing or communicating? Provide examples of how you are communicating context and purpose in your briefs, and where you think you can improve.

8. **What, to you, is the most important thing you've learned so far and why is it important to you?** Since this is your opinion, there are no wrong or silly answers. Your answer doesn't even have to be related to any of the learning outcomes or lessons, but maybe just something you've realized through the class.

9. **Based on the content of this course, what is something you're interested in learning more about in the future, are still confused about, and/or would have liked to cover more extensively in the class?** If you feel you didn't get what you needed or wanted from the class, I'd like to know so I can revise for classes going forward. Also, this is a great way for you to think about how you can expand your own learning in your future classes to personalize your education and make it yours.

10. **Based on your answers above, what grade do you think you have achieved in this class?** Refer to the Learning Assessment Rubric and the grading scale in the syllabus (reflected in the answers below) to make your decision.

A: Student has achieved **Strong** in all learning outcomes.

B: Student has achieved **Strong** in most learning outcomes, **Standard** in the rest.

C: Student has achieved at least **Standard** in all learning outcomes.

D: Student has achieved at least **Standard** in most learning outcomes, **Needs Work** in a few.

F: Student has achieved **Needs Work** in most learning outcomes.

NOTES

[1] Susan M Brookhart, Thomas R. Guskey, Alex J. Bowers, et al, "A Century of Grading Research: Meaning and Value in the Most Common Educational Measure" in *Review of Educational Research* 86(4) (2016), 803–848, https://doi.org/10.3102/0034654316672069.

[2] Alfie Kohn, Foreword to *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* ed. by Susan D. Blum (West Virginia University Press, 2020).

[3] Peter Elbow, "Grading Student Writing: Making it Simpler, Fairer, Clearer" in *New Directions for Teaching and Learning* 69 (Spring 1997), 127.

[4] Jesse Stommel, "How to Ungrade" in *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* ed. by Susan D. Blum (West Virginia University Press, 2020), 28.

[5] Ruth Butler, "Enhancing and Undermining Intrinsic Motivation: The Effects of Task-Involving and Ego-Involving Evaluation on Interest and Performance" in *British Journal of Educational Psychology* 58(1) (1988), https://doi.org/10.1111/j.2044-8279.1988.tb00874.x.

[6] Laura Gibbs, "Let's Talk about Grading" in *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* ed. by Susan D. Blum (West Virginia University Press, 2020), 98.

[7] Starr Sackstein, *Hacking Assessment: 10 Ways to Go Gradeless in a Traditional Grades School* (Times 10 Publications, 2015).

[8] Going gradeless in a semester where students and faculty were forced into remote teaching halfway through due to a pandemic was both the best and worst decision I could have made. It allowed me flexibility in changing the course to accommodate the new online structure, and it took a lot of pressure off the students who now had to adapt to a completely different method of learning. It also created a lot of confusion for the students, who were still grappling with "how well" they were doing in class, when suddenly the traditional methods of feedback were entirely up-ended.

[9] Sackstein, *Hacking Assessment*, 24.

[10] Dan Rothstein and Santana Luz, *Make Just One Change: Teach Students to Ask Their Own Questions* (Cambridge, Mass: Harvard Education Press, 2011), 120.

[11] Rothstein and Luz, 16.

[12] "Zachary Vernon," Rate My Professors, accessed April 1, 2021, https://www.ratemyprofessors.com/ShowRatings.jsp?tid=2455148.

[13] Christina Katopodis and Cathy N. Davidson, "Contract Grading and Peer Review" in *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* ed. by Susan D. Blum (West Virginia University Press, 2020): 105–122.

[14] Marcus Schultz-Bergin, "Grade Anarchy in the Philosophy Classroom" in *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* ed. by Susan D. Blum (West Virginia University Press, 2020): 173–187.

[15] Kohn, Foreword, xvii.

[16] Susan D. Blum, ed, *UNgrading: Why Rating Students Undermines Learning (and What to Do Instead)* (West Virginia University Press, 2020), 5.

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ARCHITECTURE MAKING TRIVIA: EXPLICATING THE PRECEDENTS IN THEIR NARRATIVES

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INTRODUCTION

This paper takes on long since has been used pedagogical design education approach, learning from the precedents, to tackle the initial uncertainty of Covid19 lockdowns. Architecture Making Trivia is an online workshop. It was held when the first-stage lockdown measures were just introduced, a limbo moment as our university asked us to refrain from any sort of design-related activities or events and when we would resume our design studio was unclear.

In Architecture Making Trivia, the brief was to find drawing sets of a precedent from online resources and make models by using materials from the things they commonly use during the lockdown. And, in the making, it was important to discover the aesthetics of the materials they choose by reclaiming them as their project required. The workshop was not about doing the exact model of the projects, but to reflect the students' interest in the making. This workshop initially was aimed to keep the students engaged with the design studio during all the turmoil. Using the precedents as a conversation starter (or here as the means of making) we were able to unfold varieties of architectural design explorations. The unexpected twist of the process was the reclaiming of the lockdown materials. This approach glitched the realm of these precedents by adding another narrative of the new-normal everyday. The solid gap between these architectures and the first-year design students crumpled.

Now, picture John Hejduk's *Wall House*[1] on your mind and re-imagine it with these features; slightly off proportioned, colours somehow matching, one room has letters from a famous cologne brand and another room has a telephone number printed on. Or, remember Terunobi Fujimori's *Takasugi-An*[2], raised fairly above wooden pillars, now re-imagine it rising from a one-kilo yoghurt container, its roof tiles are knitted. And, his *Beetle's House*[3] as a folded, bent Birkenstock box on uneven wooden brushes. Or Steven Holl and Vito Acconci's *Storefront*[4] as a slightly off-proportioned model with a magenta pink potato sack bursting out from the rotating surfaces towards the front street. And, Aldo Rossi's checkered marbles of *Monumento a Sandro Pertini*[5] made from wafers. See Figures 1-4.

In this paper, I aim to rethink learning from the precedents as an anchor to explore the probabilities of an online first-year design studio, Architecture Making Trivia is the research of this attempt.

Figure 1. A: Günsel Şentürk, Storefront Art & Architecture, 2020; B: Göknur Çağırı, Koshino House, 2020; C: Z. Murat Yıldırım, Takasugi-An, 2020; D: Mehmet Sait Aktay, Wall house 2, 2020 E: Şevval Ay Beetle's House, 2020. F: Tuana Öztürk, Maison Bordeaux, 2020.

THE EXISTENCE OF THE PRECEDENTS IN THE DESIGN STUDIO

The existence of the precedents in the design studio is a complicated matter in terms of the studio pedagogy and the authorship of the creative making. Firstly, we deliver our approach of the studio by critically situating ourselves among them. And, we refer to them during the crits and presentations. Commonly, precedents have their place in the history and theory courses in curated series of a certain historical theoretical aspect. Therefore, the related discussions and explorations are rigidly defined. Precedents appear in design studios as well, mostly as part of the seminars.[6] But, taboos arise in the studio when students copy them. In the process-driven design environments, the necessity to encounter various historical, theoretical and contemporary references are presumably be abolished with the very idea of copying. And meanwhile, the object-oriented design studios are more bothered by the issues of uniqueness and authorship. Thus, there is this palpable gap between the precedents and students both as individuals and designers in the design studio.

There are explorations on this complicated issue. Such as Sevgi Türkkan's comparative experiment of the first-year design studio to architectural design masters' studio where she attempts to unravel the existence of the precedents by devising them as found objects for manipulations. These manipulations would differentiate the creative acts and designing environment of the studio.[7] Jennifer Bonner uses precedents in her first-year design studio by analysing them along with the architecture of the ordinary. And later on, she explores the techniques of "copy-paste" as the method of making bending the palpable gap between the students making and the precedents.[8] Colin Rowe is the prior figure for the explorations of precedents in architectural design education. In a broad sense he "did not kill the possibility of architecture with history, which often can happen, yet offered a necessary measure of historical erudition and imagination that provided students and teachers with historical context."[9]

Precedents are there for us to speculate by our imaginations and current conditions. If we look at art and literature, this is not an unprecedented approach. We can trace it back to the beginning of the 20th century onwards with Dadaists, Surrealists,[10] Fluxus movement, Structuralism and as such. These movements have already reflected on architecture.
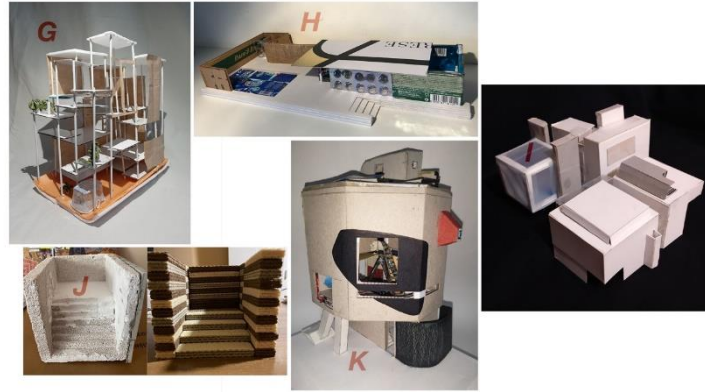
Figure 2. G: Gülşah P. Arı, NA House, 2020; H: K. Kaan Yılmaz, Barcelona Pavilion, 2020; I: A. Hümeyra Yeşilyurt House X, 2020; J: Hüseyin Demir, Monumento a Sandro Pertini, 2020; K: G. Betül Kurmaç, Suzuki House, 2020.

BLURRING THE AUTHORSHIP

If we follow Marcel Duchamp, blurring the authorship is a creative act. He describes it as reciprocal; the creative work is deciphered and interpreted by the spectator and this is essential rather than what the artists claim of their work.[11] Therefore, the creative act is a mutual relationship of the making that tends to define both the maker and observer. When Roland Barthes declared the death of the author, he suggests something similar. He defines writing as a "natural, composite, oblique space where our subject slips away, the negative where all identity is lost, starting with the very identity of the body writing."[12] This is where the author loses their authority on the text as it unfolds by the encounters with the reader. Therefore, blurring the authorship begins with the observer, reader, audience where their interpretations and experience define the variable meanings of the work. Precedents in the studio, however, sharply define their borders; the observers are allowed to echo in their existence.

When we think of precedents as collaborators in the studio, can we alter their rigid existence?

David Shapiro discusses the translation of poetry to architecture in collaborative work and how the in-between is multiplied with *mistranslations*. He talks of them as unavoidable and so should be anticipated; the contingencies of creative work are based upon these kinds of frailties.[13] In translation, there is a binary position for both the translation and the translated; in this way, they corrupt and explicate each other. If we think about the precedents as participants and the creative making of the studio as their mistranslations; their existence, circumscribed forms and discussions become contingent for a certain time. See Figure 4, the *mistranslations* of the precedents.

With all these discussed above, the workshop I talk about tackles something purposefully mundane and trivial.

Barthes in his reading of the filmic investigates the stills from Sergei Eisenstein's *Ivan the Terrible*[14] and extracts ephemeral meanings that are purely free, as they are not bounded with a signified – they are sole signifiers that arouse in the encounter with the audience. Barthes defines it as the *third meaning* that is "the obtuse meaning of trivial, the futile, the false, the pastiche."[15] The *third meaning* is unbounded from the narrative yet not destructing the whole meaning either; adding in new folds of meaning as we experience the filmic. It is ephemeral. Here I want to make an analogy of the third meaning in the aspects of this workshop.

Tackling the existence of the precedents in the design studio is a challenging act; students and tutors reference them when they discuss the projects, yet the design-making in the studio creates palpable boundaries between the precedents and the student work. I believe that the making in Architecture Making Trivia explicated the meaning and narratives of the precedents. Quite similarly to the third meaning, the workshop enfolded obtuse and trivial narratives in the solid existence of the precedents. In the following, I will be explaining the details of this making.

Figure 3. L: Dilara Kutay, Storefront Art & Architecture, 2020; M: Furkan Özbek, Vitra Fire Station, 2020; N: Ilay Söyüncü Wall House 2, 2020; O: Sümeyye Yıldız, Maison Bordeaux, 2020; P: Elif Tatlı, Slow House, 2020; Q: Mine Ekici, Storefront Art & Architecture, 2020.

ARCHITECTURE MAKING TRIVIA

Trivia was first used by Logan Pearsall Smith in his book *Trivia*, defined as; little bits of knowledge of little consequence with no depth and of unimportant, obscure matters.[16] [17] This is a two-volume book with essays on about anything in no particular order. Around the mid-1950s quiz shows on TV used the term and the word become internationally popular with *Trivial Pursuit,* as a game that is played with quizzes of arcane knowledge.[18] The title, *Architecture Making Trivia*, defines the workshop as it is; little bits of knowledge, no-depth information for the making of architectures.

The workshop was in April 2020, when the lockdown measures were just introduced. Universities closed doors and most of the students went back to their family homes. This was a limbo moment for our design studio. ITU Faculty of Architecture asked us to refrain from any sort of design-related activities until the studios resume after the lockdowns. This was to keep the pressure off from the students. However, the ambiguity of the duration was unsettling for the first-years. The initial idea was to organise a workshop for the sociality of the students. The workshop was aimed to keep the students engaged with the studio and use architecture making as a conversation starter during all the turmoil. The workshop was to have several online sessions and one of the objectives was to expose students to the theoretical discussions about the precedents they will be working on. Twenty-three first-year students participated.[19]

In Architecture Making Trivia, first I asked students to write their names in the numbered list of projects on a Google doc. There were no restrictions or orders of choosing, they can all chose the same project or accumulate in certain ones. This was for them to do a quick search for each of the projects before choosing one and gaining very basic knowledge about all of them. The initial task was

to find drawing sets of the chosen project and make its model. This was not about making the scaled-model, but to follow their interest in these projects and reflect it to their making. In the first two sessions, we have talked about the projects in general and their plans for model making. We were talking about *House X* from Peter Eisenmann with Zaha Hadid's *Vitra Fire Station* and Mies van der Rohe's *Barcelona Pavilion*; there were no curated context or hierarchy between the precedents. We were discussing how *House X* was not about model making but drawing, meanwhile looking at Terunobu Fujimori's found wooden pillars for the tea house or the marbled surfaces of *Barcelona Pavilion* versus *Storefront*'s rotating panel walls. We casually looked at plans and sections, tried to read them and talked about their ambitions, contexts and structures. In the model making, the only rule was to reclaim the materials from commonly used things during the lockdown. Most of the students did not have access to their tools and materials and, I suggested using reclaimed materials. Implementing lockdown-related materials in the making, which was part of a very practical and convenient intention, glitched the realm of the precedents with the new-normal everyday and added another narrative.

While the precedents became mementoes of the first stage lockdown days, it was also possible to obscure their existence in the design studio. This was precisely the reason that students thought of these projects as their own. The solid gap between these architectures and the first-year design students crumpled. Using the precedents as a conversation starter – the means of making, elevated the variety of architectural design explorations.

In the third session, I introduced a reading set for each project and asked students to think of their making by their context. The aim was for them to develop a critical approach to the project rather than referring to them with generic information. It was against the nature of the trivia, however, the process prepared the participants for this kind of exposure. I emphasised that it was not necessary to understand all the discussion, they just needed to find something in the text that might be interesting to them. The objective was to open up discussions of these texts with guest critics in the following session. This approach helped them to join in the discussion with the guests. Therefore, the final session turned into four sequential sessions to have in-depth conversations. We guests[20] and had discussions on these precedents in terms of the student's making; reclaiming of the materials, how they deciphered the project, the interesting parts of the project and in parallel to the above, we also talked about the related readings. Such as looking at *Barcelona Pavilion*'s asymmetricity in the composition of its components rather than the components itself[21] was in the model of the workshop as different kinds of snack packaging and vitamin pill cases (Figure 2); or the bent Birkenstock box and uneven brushes marking the ground were references to *Street Observation Society* and their everyday records[22] (Figure 1); the fluidity of the interior and exterior, public bodies were modelled with a pink potato sack, pavement and stocking covered the upper floor in *Storefront*[23] (Figure 3). Thus the final sessions were not about the precedents as we would commonly expect, but about the students. Here the creative act blurred the authorship and the body of the writer was diminished among their readers/observers.
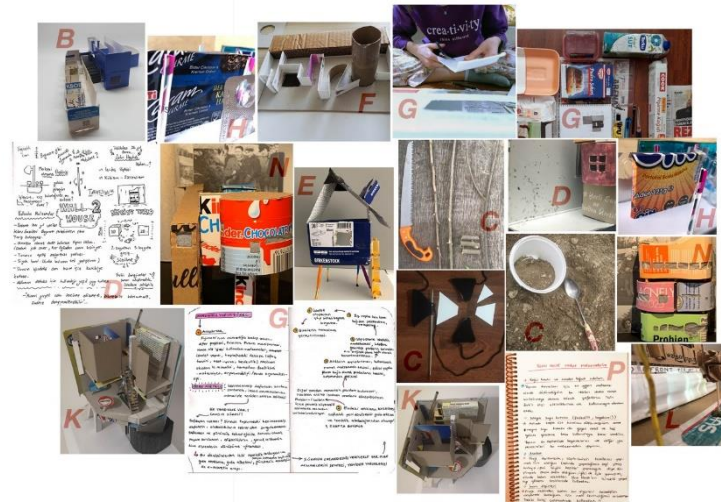
Figure 4. Architecture Making Trivia: Mistranslations of the lockdown days, enabling the third meaning.

CONCLUSION

This paper is an attempt of rethinking learning from the precedents as an anchor to explore the probabilities of an online first-year design studio. Therefore, the paper investigated the special conditions of the global pandemic reflected on online studio by focusing on Architecture Making Trivia. This was an online workshop, aimed for the sociality of the first-year design students among all the ambiguity of the first stage lockdowns. In the workshop, the potentials and limitations of an online design studio enabled the precedents as the exploration method in the making rather than being references of inspiration. The unexpected twist was to reclaim lockdown materials due to inaccessible modelling tools and materials; this way students regarded the models as the mementoes of the lockdown days. This was precisely the reason that students thought of these projects as their own. The solid gap between these architectures and the first-year design students crumpled. I find the process of this online workshop, though may be based on the inadequacies of the first stage lockdowns, liberating both for the existence of the precedents in the studio and expectations of delivery from the students. Quite similarly to the *third meaning,[24]* this workshop of making by the precedents has the same behaviour; it subjectively explicated the narratives, created obtuse meanings of the precedents for a short time. The palpable gap we tiptoe around between precedents and the first-year students in the design studio was somehow demystified. The authorship was blurred with the creative making.

NOTES

[1] Hejduk, John, *Wall House 2*. 2001. Gronningen, The Netherlands.

[2] Fujimori, Terunobu, *Takasugi-An*.

[3] Fujimori, Terunobu, *Beetle's House*.

[4] Holl, Steven and Acconci, Vito, *Storefront for Art and Architecture*. 1992. New York, USA.

[5] Rossi, Aldo, *Monumento a Sandro Pertini*. 1990. Milan, Italy.

[6] Türkkan, Sevgi and Erdem, Arzu, 'Experiments with the Concept of Authenticity in Studio Pedagogy: Designing with Precedents'. *MEGARON* 11, no. 2 (2016): 187–200.

[7] Ibid.

[8] Bonner, Jennifer, 'Architectural Elements: Wall to Roof and Floor to Window'. In *Abstracts*, Vol. 34 (1), 2018.

[9] Weiner, Frank and Martin, Shelley, 'The Education of an Architect: 3 Points of View-Rowe, 3 Points of View-Rowe, In *93rd ACSA Annual Meeting Proceedings*, 197, n.d.

[10] Türkkan, Sevgi and Erdem, Arzu, 'Experiments with the Concept of Authenticity'

[11] Marcel Duchamp, 'The Creative Act'.

[12] Barthes, Roland, 'The Death of the Author'. In Image-Music-Text, translated by Stephen Heath, 142–48. London: Fontana Press, 1977.

[13] David Shapiro, 'Poetry and Architecture: Mistranslation and Collaboration'. *RES: Anthropology and Aesthetics*, no. 32 (Autumn 1997): 81–82.

[14] Sergei Eisenstein, *Ivan the Terrible*.

[15] Barthes, Roland, 'The Third Meaning: Research Notes on Some Eisenstein Stills'. In *Image-Music-Text*, translated by Stephen Heath, 52–68. London: Fontana Press, 1977.

[16] Smith, Logan Pearsall, *Trivia*.

[17] 'Ibid.

[18] 'Short History of Trivia'.

[19] My gratitude is towards all the students for their meticulous making and intriguing discussions. The participants were M. Sait Aktay, Ecem Alkan, Gülşah P. Arı, Şevval Ay, Yaren Barlas, Göknur Çağırı, Sevban Dağlıoğlu, Hüseyin Demir, G. Betül Kurmaç, Dilara Kutay, Feyza D. Okudurlar, Furkan Özbek, Beyza Nur Öztürk, Tuana Öztürk, Tuğba Sert, İlay Söyüncü, Günsel Şentürk, Elif Tatlı, A. Hümeyra Yeşilyurt, Z. Murat Yıldırım, Sümeyye Yıldız, K. Kaan Yılmaz.

[20] I want to thank all our guests critics for the intriguing discussions and comments; Sema Alaçam, İpek Avanoğlu, Zeynep Aydemir, Begüm Eser, Uğur Sarışen, Aslıhan Şenel, Hakan Şengün, Sevgi Türkkan, Buse Özçelik, Elif Öz Yılmaz,

[21] Evans, Robin, 'Mies van Der Rohe's Paradoxical Symmetries'. *AA Files* 19, no. Spring (1990): 56–68.

[22] Daniell, Thomas, 'Just Looking: The Origins of the Street Observation Society'. *AA Files*, no. No.64 (2012): 59–68.

[23] Acconci, Vito, 'Parks, Streets, and Vehicles'. *Space* 54, no. Autumn (1995): 23–33.

[24] Barthes, Roland, 'The Third Meaning'

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LEARNING FROM SHADOWS: RECLAIMING THE FIRST-YEAR DESIGN STUDIO ON THE SURFACES OF THE PARENTAL HOME

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INTRODUCTION

This paper follows our teaching experience of an overlooked social aspect of online education, where we reclaim the first-year design studio inside the parental home during the COVID19 pandemic. The absence of an actual studio in online education has been immensely discussed however, the issues of its unfamiliar physical setting are usually disregarded. Studying design, needlessly to say, rarely go well with parents. When the lockdown measures were introduced and Universities closed doors, most of the students went back to their parental home. This triggered an elusive issue that affected our design studio; the unfamiliarity of the familiar or, parents' house as the new design studio. Therefore, we planned a design-making approach that responded to many odds of this issue in online design education, see Figure 1. We named this as *The Loop of projecting: tracing: cutting: modelling: drawing* and, we presume it called out the bold and daring side of the first-year student and helped them to claim their designing realm in their parental house.

The loop of projections is an ephemeral spatial design making; it would deploy its realm on surfaces as the projections last. This enchantment bends the reality of the unfamiliarity in the parental house. And as tutors, we can talk through these projections as if spatially experiencing them. This is a witty threshold of making and speculating design; we are back inside Plato's Cave, not interested in the reality behind the shadows but fascinated by the realm of anamorphic, distorted projections. Tracing out the ephemerality of shadows and, getting lost at the conjunctions with each cycle of making extend the probabilities of online design education with a twist of hands-on making.
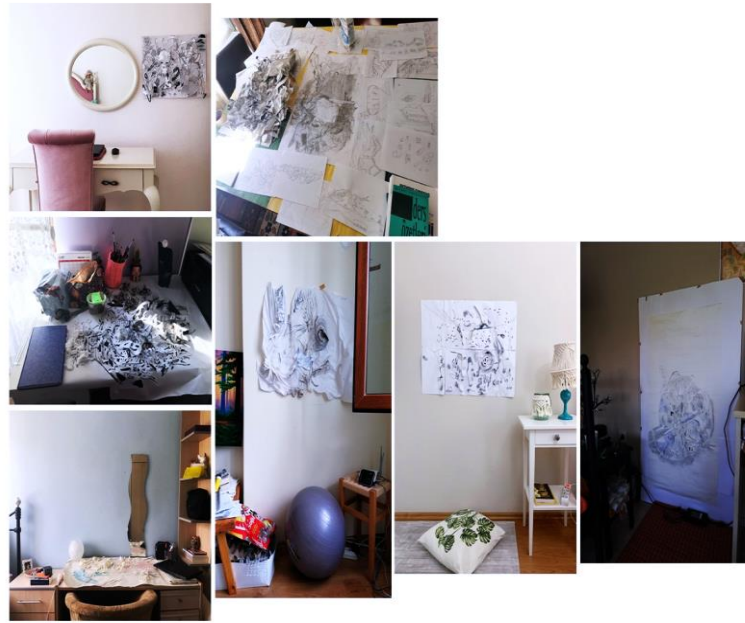
Figure 1. Online Studio at the parents' house.

THE IMAGINARIES OF THE FIRST-YEAR DESIGN STUDIO

The first-year design education in ITU has been exploratory since the mid-90s, and an interdisciplinary one since 2002 when architecture, landscape architecture, and interior design majors were joined for the first-year design studios, connecting three disciplines and tutors to allow a speculative, unconventional design education environment. Since 2015, urban and regional planning and industrial design majors are added, broadening our chances of working on the extremities and exteriorities of our disciplines. Aslıhan Şenel compares this to *the formation of nebulas*; rather than creating star systems in the studios, tutor becoming the star and students orbiting around them, the design environment we are interested in are similar to early interconnections that are ephemeral in a sense, strong enough to create masses for the *protostars* yet easily shatter moments after.[1] Therefore, our design studios are highly controversial to the static, conventional expectancies of first-year design education. Here design learning is a *performative act* both for the tutors and students; the process and outcomes are the mediums for performative exploring for all the participants.[2] The first-year design studio is planned with short-term projects, that have durations of a day to three weeks. There are several aims of having shorter modules; the fundamental aim is a strategical one, to shift the emphasis towards the practice and experience from the object-oriented expectations;[3] another aim is to shuffle student groups and tutors with each project, allowing them to create new relationships as they experience the studio together. The distinction between collaborative and individual designs in the first-year is fluid and the size of the student groups is defined with each module. One example of the extremities of questioning the authorship and the object-oriented approach was a meeting exercise that blurred the distinction between individual and collaborative design.[4] These projects can be about designing the gaze in its intuitional, topographical, and existential context,[5] or explore manifold narratives of curiosity that tackle the discovery of individual, topographical, tactile imaginations.[6]

ALTERNATING THE IMAGINARIES OF THE FIRST-YEAR DESIGN STUDIO
Distance Design Education

Online learning and virtual design studios have been here and not even trending as they were in the 90s to 00s when internet usage boosted all around the world.[7] [8] The Covid19 pandemic and its lockdowns revived this topic in an unprecedented manner. Distance design education is mostly discussed in its comparison to campus learning as the collaborative, performative and reflective design learning environment is inherent in studios. Firstly, there is the emphasis on imitation where online learning mirroring campus learning in terms of delivering the topics and planning the process[9] and how this mimicry fails as it disregards the reality of online learning. Secondly, the discussion focuses on the different capabilities of learning between the two, such as online learning providing knowledge on digital tools and programs[10] rather than creating "enhanced learning processes and outcomes."[11] One of the essential discussions is on peer-to-peer learning. This is a key drawback in online design education if we think of design studios as performative learning environments. Peer-to-peer learning is the primary part of studio-based learning, and how the tutors enhance this environment is crucial for the students.[12] In online studios, however, peer-to-peer learning is an unsolved issue; the students feel uncertainty in the borders of anxiety as they are unsure where to position their work among their peers.[13] Moreover, in an online studio, there are challenges in developing critical discussion sessions. Online sessions require structure to avoid either awkward silence or cacophony, yet a structured session would spoil the needed free-flowing dialogue for the design process.[14] In this aspect, becoming the online facilitator is a role, added to the tutors.[15] Our students emphasised this during our interviews as well; "Our exchange of ideas was better when I was in the studio with my friends. We did an online group assignment too, but I didn't think it was as productive as it was in the studio... Because we would discuss in the studio, look at each other's work or get influenced from what we liked."[16]

However, several approaches are tackling the reality of online learning such as; *situated learning* and *authentic tasks*. These approaches are quite convenient for a design studio by nature. *Situated learning* approach emphasises contextualizing learning as social and interactive. This enables students to develop their individuality from the knowledge and experience of the studio and to apply them to the topics beyond the studio.[17] And, *authentic tasks* are described as ill-defined; fragmented with sub-tasks, related to real-life situations, in need of essential investment of time and research while the outcomes of their making are meticulous; these tasks have a presence of their own.[18] Following is our approach of establishing a situated, tailored online design studio for distance education during the Covid19 pandemic.

The first-stage lockdown measures were introduced to Universities in Turkey starting on the 16th of March 2020 as a precaution for three weeks.[19] However, with the rising cases, ITU decided to resume the spring term as an emergency distance education starting in April, without the studios. And later on, design studios were also decided to be in the program and we resumed our studio online on the 28th of May. We had 123 students, of which normally %44 use students' accommodation, flat-share, and %56 live with their parents or family members (family members include flat-sharing with relatives, away from the parents), see Figure 2. When the lockdown measures were introduced %64 of them moved back to their family houses. This meant most of the students resumed their studies in an unfamiliar environment in terms of design learning. Students accommodating in the dormitories and flat-shares had left Istanbul thinking to return in three weeks and had left all their design materials. Therefore, our online design studio needed to address the lack of a studio, design materials and tackle the existence of an unfamiliar environment.
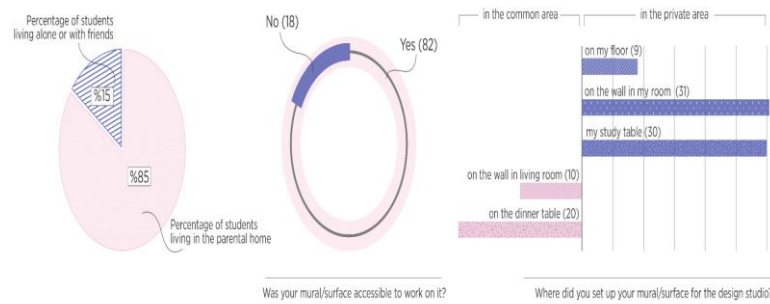
Figure 2. The first-year design studio of the parental home, by Begüm Eser, 2021.

Heterotopias: Alternative Imaginaries

In the context above, our first-year design studio, named *SpacelyandGood*, consists of architecture, urban and regional planning, and landscape architecture students and tutors.[20] Our project was titled *Heterotopias: alternative imaginaries*, see Figure 3. It had a five-week duration including short-term workshops and table discussions. This project was the final module of the year, see Figure 4. We aimed to open up a critical, controversial field for heterotopic scenarios and discussions of our times. It was crucial to enable discussions of the manifold urbanities in their anthropocentric, heterotopic context by critically designing imaginary lands. The module was divided into parts. They were of different scales and aspects related to the main theme, see Figure 5. There were no constraints, no specific site, or a user profile. We emphasised to pursue the strange and wander in their imaginary heterotopias with this brief;

 "think about terrestrial territories, wetlands, badlands, ghost towns, townships, abandoned industrial sites, contaminated fields, canyons, floodplains, and urban rift/deprivation zones.
think about passages, boundaries, forking paths, dead-ends, closets, burrows, bunks, towers, pitches, nests, nooks, ditches, burrows
think about mobilities, relationships, senses, meanings
... these strange things can be many or one / they need to have layers/surfaces for human interaction"

Following, we will discuss our design manoeuvres for this module and tactics of establishing a remote first-year design studio in the physicality of projecting and tracing shadows.

Figure 3. The poster of the project, by Bihter Almaç, 2020.
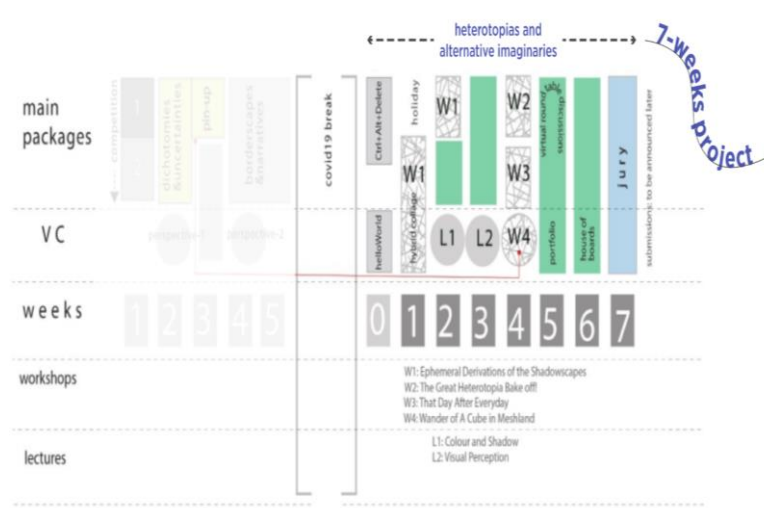
Figure 4. Combined schedule of online education, by Begüm Eser, 2020.

Figure 5. Parts of the module, by Begüm Eser, 2021.

LEARNING FROM SHADOWS

The *Loop of projecting: tracing: cutting: modelling: drawing* was the primary approach of spatial design making in our project. It was a performative enactment that would deploy its realm onto the physical surfaces as the projections last. This enchantment bent the reality of the parental house and transported students back to the studio. The performative design learning environment was established with each loop of making. Therefore, these performances were also the focus of the feedback sessions, as tutors were able to imagine these projections as if spatially experiencing them. The initial task was to prepare a surface, the mural. This was a more or less 180x140cm surface covered with drawing-friendly materials. We also asked them to collect objects with various materiality and texture. After the murals were set, we began to use this surface as our studio. We started the loop by creating

shadows with projections from the objects they gathered, combining varieties of them, playing with the distance to the light source and projected surface, see Figure 6. And later, we asked them to trace the ephemerality of these projections by drawing, cutting and modelling, see Figure 7. There were several cycles of making. They continued casting shadows and projecting lights on the mural as they were etching, engraving, layering the surface. The anamorphic shadow casts deformed on the manifolds of accumulating surface, creating cryptic forms to speculate, see Figure 8. We encouraged students to explore another loop of making whenever they were stuck and they continued to add on as they felt it was necessary. At some point, we announced that this was the imaginary topography of their heterotopic scenarios, see Figure 9. Students worked on their heterotopic scenarios, the Anthropocene and continued to explore its alternative imaginaries among the anamorphic, distorted shadow casts of their mural. The final submission of the project was in the form of a booklet that was called *the book on the imaginary*, see Figure 10.

At the end of the term we carried on a survey, 102 students participated. And, one month after their submission, we have interviewed 12 students. These interviews were semi-structured and the questions were divided into two groups. When we asked about *the loop,* it was possible to see our aims of this kind of making reflected on their comments. Following are some of the feedbacks. On the enchantment of the projections and bending the reality of the parental home;

"...the shadow part at the beginning, was more fun because I made that part more dramatic. I was playing music in the background and recorded myself as if I was an artist and I felt like I was working in the dark in the studio."[21]

"It was next to my bed, I was constantly looking at it when I woke up in the morning or before I went to sleep at night...I was particularly interested in the slits created by the shadows. I felt as if I was walking in it...I thought in that part I can design a place where the public will meet. Also, none of the shadows had very sharp lines, and that's why my design - the structures or models I designed did not have sharp lines, but rather curved shapes with softer lines."[22]

On using cycles of projections as a making tool for spatial exploring;

"The objects I used were made of glass with crystal shape. I combined objects in projections. There were reflections with colours and after I noticed that I reused, added or removed [the objects]… *At first, I played a little more with the colour reflections, I played with the objects; some trials became too opaque, with no lights in shadows. After a while, I began to choose the materials of the objects I used; what will happen, which one is better? I continued like that…"[23]*

"It was more imaginative, we could constantly improve our project by drawing, and we could add new shadows whenever we wanted. In the previous projects, when we made a model or something, this restricted us a little; our imagination. Because we were making the model, then it would finish, and we would do the drawings; but here we had a chance to develop our project while drawing ..."[24]

"I took a very simple sketch from my shadow-mural. I drew this sketch on paper and reflected shadows on its interiors. The final form of the project began to form in this way"[25]

On using this making for exploring spatial iterations;

"There was an uncertainty, for example, I was adding something to the model one day, I was looking at it the next day, and something different was coming out from it. It was always open to improvement, I enjoyed it the most."[26]

"...The part of using Mural exactly for design. Because there were generic spaces in my work and it helped me a lot with that. It was helpful for me to design by looking at and interpreting shadows and reflections to experiment with forms. That was my favourite part."[27]

"...Yes, I tried to increase my shadows. In one of them[loop] *it was very dense, a certain part of it, and in our scenario, there was a central place... but I did not have a centre on the mural. You know, everywhere in the topography was alike... I created it later, removed the middle part and repeated the same shadows. Then I took it to the third dimension by differentiating it more."*[28]

Figure 6. Image taken from the Book on the Imaginary, by Çağıl Öztürk (2020).

Figure 7. Image taken from the Book on the Imaginary, by Gülşah P. Arı (2020)
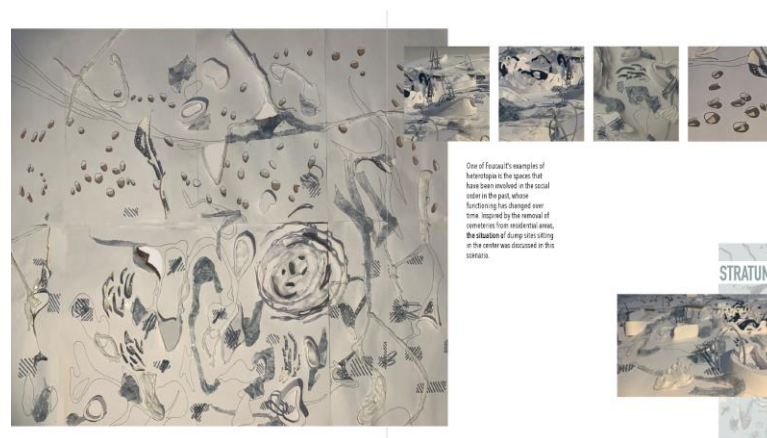
Figure 8. Image taken from the Book on the Imaginary, by İlay Söyüncü (2020).

Figure 9. Image taken from the Book on the Imaginary, by A. Hümeyra Yeşilyurt (2020).
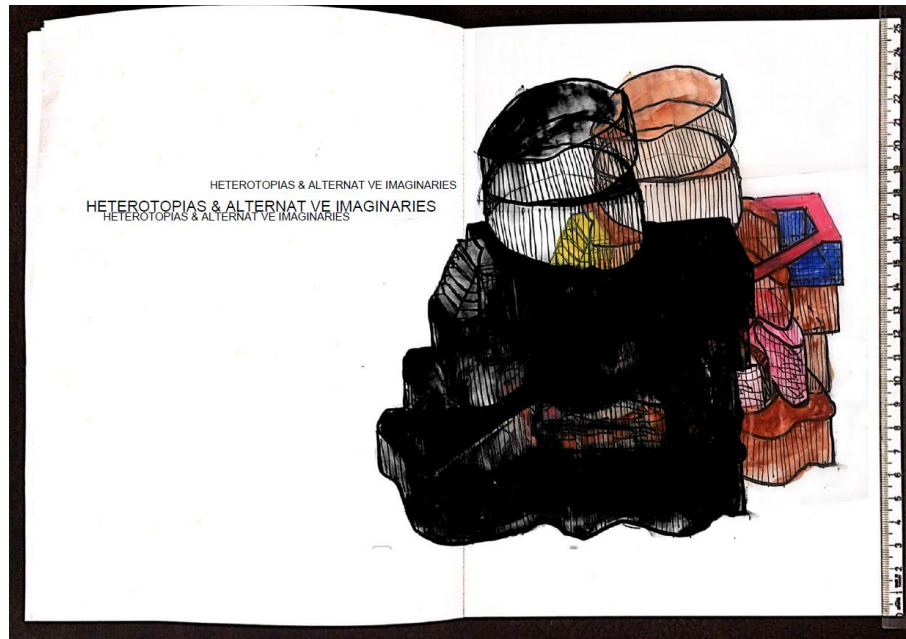
Figure 10. Image taken from the Book on the Imaginary, by Şebnem G. Berçin (2020).

CONCLUSION

Loop of projecting: tracing: cutting: modelling: drawing was a performative, spatial iteration. This was an attempt to seek our design education approach in the overlooked physicality of online studios. Exploring abstract shadows; daydreaming among their distorted projections to create unexpected topographies and forms to discuss a complicated topic – heterotopias, was a daring position. However, casting shadows and layering up the mural enabled us to smoothly engage with something unknown, intricate by turning it into tacit, accessible hands-on making. Making the mural was an innate process for the students precisely because they were fascinated by their own making of unexpected shadow casts. We initiated the beginning of the project over this accumulation of distorted, cryptic forms.

Students were layering up the mural playfully; exploring the shades of shadows; juxtaposing them; repeating the cycle; bending the shadow by altering the projected surface, etc. This making enabled us to easily shift between different scales. We would look at the formations of making on territorial, experiential, poetic levels and speculate them in terms of places of encounter or seclusion in their heterotopic scenarios. The *loop* was a threshold of making and speculating design; we were back inside Plato's Cave, not interested in the reality behind the shadows but fascinated by the realm of anamorphic, distorted projections. Tracing out the ephemerality of this realm, getting lost at the conjunctions with each cycle of making extends the probabilities of design-making. We believed that this extended the probabilities of remote design-making where it was possible to perform our design environment acts together.

NOTES

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[2] Türkkan, Sevgi, Şenel, S. Aslıhan, and Kürtüncü, Burçin, 'Studio as a Critical Performance'.

[3] Türkkan, Sevgi, Şenel, S. Aslıhan, and Kürtüncü, Burçin.

[4] Almaç, Bihter, 'The Factory: An Experimental Studio for Discovering the Other'.

[5] Aydemir, Ayse Zeynep and Almaç, Bihter, 'Gaze Machines of Field'.

[6] Almaç, Bihter and Aydemir, Ayse Zeynep, 'Places of Curiosity'.

[7] Strojan, Tadeja Zupancic and Mullins, Michael, 'The Identity of Place in Virtual Design Studios'.

[8] Lloyd, Peter, 'Embedded Creativity: Teaching Design Thinking via Distance Education'.

[9] Oliver, Ron, 'Exploring Strategies for Online Teaching and Learning'.

[10] Herrington, Jan, Reeves, Thomas C., and Oliver, Ron, 'Authentic Tasks Online: A Synergy among Learner, Task, and Technology'.

[11] Oliver, Ron, 'Exploring Strategies for Online Teaching and Learning'.

[12] Budge, Kylie, Beale, Claire, and Lynas, Emma, 'A Chaotic Intervention: Creativity and Peer Learning in Design Education'.

[13] Ricardo, Ricky, 'Educational Effects'.

[14] Ibid.

[15] Lloyd, Peter, 'Embedded Creativity: Teaching Design Thinking via Distance Education'.

[16] Excerpt taken from the interview with İlayda Küpeli, 28.07.2020.

[17] Oliver, Ron, 'Exploring Strategies for Online Teaching and Learning'.

[18] Herrington, Jan, Reeves, Thomas C., and Oliver, Ron, 'Authentic Tasks Online: A Synergy among Learner, Task, and Technology'.

[19] The announcement of ITU can be found here, URL: (http://www2.itu.edu.tr/duyuru/yuksekogretim-kurulunun-yeni-koronavi-rus-(covid-19)-bi-lgi-lendi-rme-notu-1), accessed in 12.07.2020.

[20] Our first-year design studio is called *SpacelyandGood* and the tutors of the term were, Imge Akçakaya Waite, Sema Alaçam, Bihter Almaç, Eda Bayazıt Ince, Melih Bozkurt, Çisem Çildir, Begüm Eser, Arzu Güler, Zeynep Günay, Elif Öz Yılmaz.

[21] Excerpt taken from the interview with Aleyna Çolak, 28.07.2020. (Question: Which part of the project was fun for you?)

[22] Excerpt taken from the interview with Gülşah Pelin Arı, 29.07.2020. (Question: How did you design your spaces from the mural?)

[23] Excerpt taken from the interview with İlayda Küpeli, 28.07.2020. (Question: How was your process of casting shadows?)

[24] Excerpt taken from the interview Helin Çiftoğlu, 28.07.2020. (Question: Which part of the project was fun for you?)

[25] Excerpt taken from the interview with Mehmet Sait Aktay, 29.07.2020. (Question: Did you use the loop of shadow casting when you were working on the final iterations?)

[26] Excerpt taken from the interview Aşık Alataşlı, 29.07.2020. (Question: Which part of the project was fun for you?

[27] Excerpt taken from the interview with Mehmet Sait Aktay, 29.07.2020. (Question: Which part of the project was fun for you?)

[28] Excerpt taken from the interview with İlayda Küpeli, 28.07.2020. (Question: How did you reflect your heterotopic scenario on the mural?)

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USE OF DIGITAL LEARNING STATIONS TO PROMOTE ACTIVE LEARNING AT UNDERGRADUATE LEVEL: THE CASE OF BUILDING PRODUCTION SYSTEMS IN ARCHITECTURE EDUCATION

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INTRODUCTION

In the 21st century knowledge society, higher education (HE) is experiencing a paradigm shift through multidimensional transition elements including change from the traditional, lecture-focused classroom setting to more learner-centred environments, integration of knowledge from different disciplines, interdisciplinary collaborations, use of information and communication technologies (ICTs) to enhance learning, globalization, and internationalization of HE as well as emphasis on sustainability.[1] With the change of education focus from traditional to lifelong, the emphasis in higher education institutions (HEI) is more on application driven, socratic, building the knowledge, inquiry based, active learning (AL), problem solving and reflective approach. HE is becoming the internal metamorphism by the learners themselves, brought about by their own agency through a number of educational resources, including interaction with faculty, content of the educational process, and the institutional environment and students are in a sense the producers of their own education and are ultimately responsible for their own development and outcomes.[2] The role of the instructors is to use their abilities to facilitate optimal learning, in turn, the role of the students should be to do their best to learn.[3] Students need assistance to organise knowledge using models and conceptual frameworks to help with information retrieval, this is at the heart of helping students develop deeper understanding; they need to see relationships and patterns and recognize cognitive dissonance in order to gain meaning from what they are learning.[4]

Even though many studies suggest that the HEIs need to be organised around students, not the academics, and classrooms should be the centres of intellectual inquiry and meaningful engagement[5] and there is a need for education reform for a shift from an 'instruction-' to a 'designer of learning methods and environments',[6,7] the traditional pedagogies still dominate HEIs and their learning landscape.[8] As a holistic approach, active learning is about balancing personal motivation for self-fulfilment with group capacities for high impact contributions in education and has direct implications and prerequisites for administration, faculty, government and various stakeholders.[9] The challenges of implementing active learning are: course redesign time[10], unwillingness of students for active learning[11], resistance of academics to lose the control, lack of both students' and academics' maturity,

difficulty in fitting into the existing academic culture and need for encouraging and training academics.[12,13,14]

Active learning strategies such as project-based learning (PBL), which enables learners to take the responsibility of their own learning with student-centred approaches can be conducive to achieving successful learning outcomes and improving learner performance. Digital environments promise valuable opportunities for learning by providing various tools and techniques for engaging learners with instructional content.

Paper reports empirical evidence regarding the application of the 'Learning Station (LS)' concept - developed by Istanbul Technical University Centre for Excellence in Education (ITU CEE)- to a theoretical undergraduate course. As a modular and flexible learning space, LS leaves a wide room for students to create and deliver their own learning content in both physical and digital environments. Started in the physical classroom, the course continued in a digital environment, following the COVID-19 pandemic, which allowed authors to observe the impacts of the digital environment on student learning. Presenting supporting evidence such as highly satisfied feedback of the use of LS concept and strong motivation by collaborative learning can encourage active learning in undergraduate education.

ACTIVE LEARNING

Prince (2004)[15] defines active learning as any type of instructional method which engages students in their learning process and requires meaningful (relevant, authentic) learning activities as well as requiring students to think about what they are doing (metacognition). AL, which dates back to the last decades,[16] is described by early studies as "co-operative learning"[17] and anything that "involves students in doing things and thinking about the things they are doing".[18] AL is often associated with constructivist theories of learning, where students learn by actively challenging and critiquing concepts developed through their own experiences or the experiences of others, possibly under the guidance of an instructor who encourages the necessary cognitive conflict.[19] Studies have indicated that students take more responsibility for their performance and see the course as being more valuable when they are invited to actively participate in the learning interaction.[20]

AL research reveals a wealth of materials detailing many examples of active learning pedagogies, methods and practical activities that can be used to encourage student engagement.[21] AL can include different forms of activation, such as increased physical activity, interaction, social collaboration, deeper processing, elaboration, exploration of the material, or metacognitive monitoring.[22]

Fundamental to the success of AL is the insistence that learners seek out new information, evaluate it, and relate it to information they already know, instead of just relying on an instructor to provide them with all of the material through lecture or readings.[23] In an effort to summarize the research on active learning effectiveness, Prince found that "empirical support for active learning is extensive", and suggested that while different types of active learning, such as problem-based learning, offered mixed results, that most active learning initiatives, according to the literature, had produced positive results.[24]

Problem-Based Learning

Problem solving, whether approached from a behavioural/instructivist or cognitive/constructivist perspective, is well supported in the research literature as an effective instructional strategy to promote learning and transfer.[25] Using problems as a basis for learning appears to be one of the more broadly applicable strategies to promote active learning since problems constitute an effective starting point for learning- as daily life is filled with a variety of problems which learners must face.[26]

PBL is an instructional method where relevant problems are introduced at the beginning of the instruction cycle and used to provide the context and motivation for the learning that follows. It is always active and usually (but not necessarily) collaborative or cooperative and typically involves significant amounts of self-directed learning on the part of the students.[27] PBL is based on the previous and newly acquired knowledge; transfers the responsibility of the learning process on the students; focuses on the process of analysing a conflict, problem or situation and clarifying the sources of conflict so that students have an active role in creating the problem and in analysing and giving solutions.[28] Choosing problems appropriate to the content and to the learners' level is a key point in promoting active learning to help build problem-solving skills.[29] In addition to the selection of a problem with real-world application, including the whole problem or task in the learning process rather than disjointed pieces of different problems or tasks can help with learning, developing flexible skills, and transfer.[30] PBL's effectiveness depends largely on the teachers' ability to execute PBL in practice and their pedagogical content knowledge, which can be enhanced by creating collaborative learning environments where students, teachers and other participants can learn from each other.[31]

RATIONALE OF THE STUDY

"How do higher education students best come to know something?" becomes a key question in higher education since the future is not only impacted by how students in higher education courses across the globe gain competence in their chosen fields and disciplines but also be impacted by how today's students apply their knowledge in order to solve problems; how they communicate, reason, argue, justify, and confirm or refute their assumptions and hypotheses; and then how they draw conclusions, and mobilize and share their knowledge.[32]

Despite the resistance for AL pedagogies, AL and its promises are desirable in higher education disciplines and researchers seek how to acquire knowledge about active learning, gain competence, adopt AL strategies and assess AL approaches in HE. Accordingly, we ask the research questions of: How can undergraduate education benefit from the potentials of active learning? How can students get actively involved with the design of their own learning experiences? How can an existing course be redesigned with active learning strategies?

The main purpose is to explore the experience of active learning in undergraduate education, which allows us to create active learning environments with suitable instruments for facilitating student engagement, to provide evidence that active learning results in higher satisfaction and to draw attention of scholars to encourage the usage of active learning strategies in undergraduate education.

METHODS

To effectively answer the research questions, the study was carried out in two main stages: (1) Adoption of the LS concept for an undergraduate course and (2) Data collection and analysis – as illustrated in Figure 1.

We adopted the LS model due to its flexibility and modularity in creating AL environments. The selected course, Building Production Systems (BPS) is a 3 ECTS-credit, theoretical, 5th semester course given in the Department of Architecture at ITU. Course content includes technological system analysis, building systems integration, comprehensive design and professional development. While more conventional methods of content delivery such as PowerPoint presentations, weekly assignments and classroom presentations were used in the previous semesters, authors used the LS concept to enable students to design their own learning experience. After the introduction of the concept, a total of 45 students were encouraged to choose a BPS topic including the points of creating value, associating with social problems, goal-driven and outcome-oriented. They designed and

developed their LSs as group projects through the entire semester. Weekly feedback on the LSs were provided for each project group in the form of interactive discussions as the projects were in progress. In the second stage of the research, content analysis was conducted to analyse qualitative data from the participants. An open-ended question regarding the positive and negative aspects of the learners' experiences, was directed through an anonymous feedback questionnaire form. Along with their thoughts on the LS model, the students also provided their comparative feedback on distance learning since they experienced both the physical and digital environments throughout the semester due to COVID-19 pandemic.
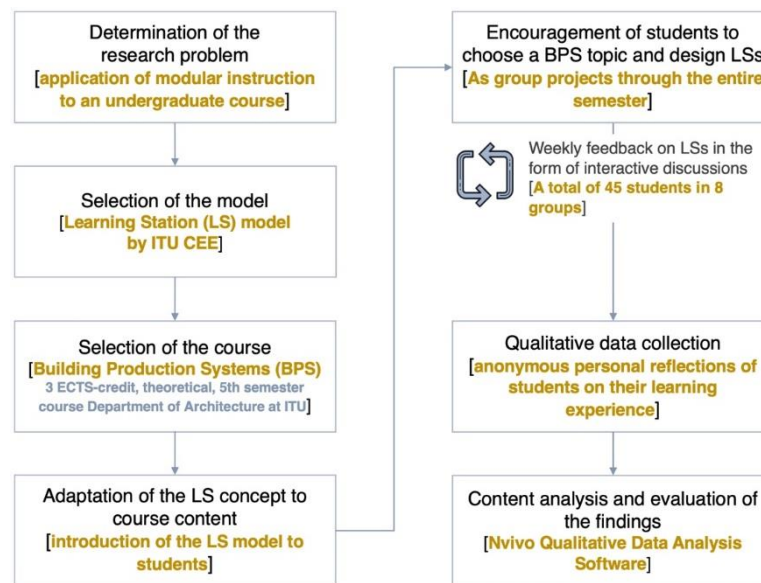

Figure 1. Research method.

Learning Station Model

As an innovative learning management model ITU CEE, LS concept promises a significant potential to improve university-industry collaboration, generate income in the form of sponsorship and other means, and support high-quality education in collaboration with alumni members through experiential learning in real-life settings and problem-solving environments, apart from building communities of learning that intertwine with the higher education system on the basis of lifelong learning. Conceptual foundation of the model is grounded on the integrated use of human resources and learning analytics combined with a lifelong learning perspective, project-based learning as an active learning methodology, and a portfolio management system to ensure the sustainability of project-based learning outcomes.

Any member of the ITU community including students, academics and graduates can volunteer to design a LS. The LS designers do not need to take an instructor role; rather, they are more like project managers, or 'learning experience designers' from the perspective of ITU CEE. Figure 2 illustrates a typical LS matrix where the left column includes expected learning outcomes and the associated content (i.e., methods, tools and techniques), while columns to the right visualize various content delivery alternatives. Using the revised Bloom taxonomy, designers are free to add any number of content delivery modes and learning materials to their LSs according to the learning outcomes they specify.

Modular structure of LS allows designers to combine and benefit from the advantages of both physical and digital content delivery options, and open the selected modules of the LSs to a larger audience (e.g., broadcasting the web seminar of a guest speaker on YouTube).

Participants of the LSs gain various skills in AL environments, where learning-by-doing is a priority. LSs can take place in physical, digital, or hybrid environments according to their designs. LSs can function within or outside the university (e.g., in the traditional classrooms, at the workplaces of graduates and sponsors, or any other place as specified by their designers). In the digital LSs, for example, designers can use the breakout rooms of the Zoom or similar platforms to conduct hands-on exercises.[33]

Unless a specific segment of the ITU community is targeted (e.g., PhD students with similar keywords from different departments), LSs are open to all members of the ecosystem, who meet the terms of application as specified by designers. LSs blend young students with alumni members based on shared interests to create synergetic learning environments, where fresh and innovative ideas meet industry experience. ITU CEE supports LS designers to find sponsors for the learning activities, following the completion of station designs which usually take a few weeks. ITU CEE announces LSs on the website[34] to receive applications. Since LSs have sponsors, learning activities have no cost for participants.

LEARNING OUTCOMES	READING	VIDEO	CASE EXAMPLE	GUEST SPEAKER	SITE VISIT	SOFTW.	PRACTICAL EXERCISE	ASSESS.
Learning outcome 1								
Content 1	✓	✓		✓		✓	✓	
Content n	✓					✓		
Learning outcome 2								
Content 1	✓	✓						
Content n							✓	
Learning outcome 3								
Content 1			✓	✓				✓
Content n			✓		✓			✓

Figure 2. Structure of a learning station.

RESULTS

The findings of the study are addressed in two parts. The first part concerns the proposed LSs and their assessments, whereas the second part presents the content analysis based on the qualitative data.

Proposed Learning Stations

Based on the research, analyses, inquiries, discussions, information exchange, internal and external stakeholder/sponsor seeking and interaction, observations and explores they performed throughout the entire semester, a total of 8 groups completed their LSs on the following topics: waste materials, post-earthquake fabric shelters, puddled clay, smart buildings, opaque facade, parametric design, additive manufacturing and seismic isolation. The instructors provided the theoretical background of the subjects sticking to the schedule of the course, along with the discussions over the LS designs. Within the course context, there were expected to use input-process-output approach to analyse their systems. In regard to team work and cooperation, they were requested to describe each one's roles and

responsibilities in completing the tasks for the LS design, through a responsibility matrix (RACI-responsible, accountable, consult, and inform).[35]

Determined criteria for assessing team performance include: problem statement/background information, input-process-output analysis, research effort, clarity, originality, identification of stakeholders/sponsors (internal stakeholders within ITU), external stakeholders (firms, NGOs, individuals, etc), use of bloom taxonomy, program detailing, number of diversity of resources/references, language, overall presentation quality, applicability and responsibility matrix (RACI).

Figure 3 shows the learning outcomes and their delivery modes of an LS for the topic of post-earthquake fabric shelters. The students of this group gathered all the materials regarding to their LS and shared them through an online platform. Further details can be found at their website.[36]

Figure 3. Post- earthquake fabric shelters LS.

Content Analysis

Qualitative analysis of the anonymous personal reflections of students on their learning experience shows that student satisfaction from learning significantly increased by the use of the LS concept. Based on the qualitative data by 28 respondents of 45 students (with 62% participation rate), Table 1 presents the results of the content analysis.

Results show that involvement of different learning methods; tackling real life problems/taking initiatives and contacting with external stakeholders; improvement in own learning skills and experience of and gain from team work have the highest frequencies. Qualitative evidence shows that the students had excitement of breaking with tradition compared to other theoretical courses. Motivation and pleasure of creating "something", and active participation and interaction during the process should be noted as remarkable facts as they point to the potential of enabling AL for especially theoretical courses. Focusing on PBL improved students' versatile thinking abilities at different scales and levels as well as the integration of theory and practice.

Along with the benefits of systematic approach for handling a problem, exploring learning and teaching at the same time had a great influence on the learning experience. The participants also underlined the positive impacts of group working through the practice in project management; knowledge sharing and improvement in social skills.

Feedback	f
Involvement of different learning methods	18
Preparation for tackling real life problems/taking initiatives (Making contact with external stakeholders)	16
Improvement in own learning skills	14
Experience of and gain from group working	13
Excitement of breaking with tradition (compared to other courses)	11
Motivation, satisfaction and joyful of creating "something"	11
Active participation and interaction during the process	11
Versatile thinking ability (multi-directional thinking ability) - at different scales/levels	11
Practice in management skills (planning, organising, leading, controlling)	10
Instructiveness of systematic approach	10
Integration of theory and practice	9
Exploring learning and teaching together	9
Knowledge sharing	8
Improvement in social skills	4

Table 1. Content Analysis Results

The content analysis also allowed us to observe the impacts of the digital environment on student learning due to COVID-19 pandemic. 10 students pointed out positive aspects whereas 2 students complained about the negative impacts of distance learning.

Figure 4 represents the keyword frequency of the qualitative data through a word cloud diagram created by NVivo Qualitative Data Analysis software.

Figure 4. Word frequency analysis.

CONCLUSION

The increasing attention to more learner-centred environments in HE, is pushing the HEIs towards rapid changes. The academics and students can benefit from the potentials of AL to improve the quality of learning and learning environments for handling this change and implementing lifelong learning strategies. The adoption of the LS concept by ITU CEE in the study where we aimed to understand how active learning environments in undergraduate education affect learner satisfaction, enabled the transformation of a theoretical course. The LS model can achieve to transfer the ownership of learning to learners and to incorporate any appropriate stakeholder through its flexible and extendable structure.

The results suggest that active learning strategies are useful to prepare students for professional life. As a team project, the design of an LS requires both leadership and project management skills for all of the participants. PBL helps students gain self-confidence -to use their voices and express themselves. Multi-directional information exchange improves learning performance.

Even though the evidence provided in this study represent a small fraction, findings may receive the attention for scholars who aim to encourage active learning approaches in undergraduate education. The dissemination and application of the LS model for different courses from different disciplines as well as its integration with different AL approaches, and data from a greater number of cases can provide further observations about the performance of LSs.

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TRANSITIONING FROM FACE-TO-FACE TEACHING TO EMERGENCY REMOTE TEACHING IN LANDSCAPE ARCHITECTURE

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INTRODUCTION

Landscape Architecture is a relatively young profession, and its pedagogy has evolved with time to keep up with technological advancements. Like Architecture and most design disciplines, Landscape Architecture is a project-based discipline with a focus on design process. It is based on experiential learning through field trips and site visits and is at the intersection of multiple disciplines while being site and context specific (location, culture, history, ecology, geomorphology, perception, seasonality, etc.). Today, teaching in Landscape Architecture mandates every school to graduate students with the required skills, knowledge, and values to form competent professionals. With COVID-19, the world confronted an unprecedented pandemic that affected the entire planet; more specifically, the education field had to continue delivering courses and classes remotely to make sure students could continue or finish their degrees. Being a site-centric program, Landscape Architecture faces new challenges when confronted to moving online. COVID-19 showed that traditional teaching methods lacked flexibility and needed to adapt to the fast-evolving digital world. This article reviews how an undergraduate landscape architecture program has addressed issues around remote teaching for its studios, theory, and practical courses with a direction to the future. We emphasize the difference between Emergency Remote Teaching (ERT) and Online Teaching (OT). ERT has been applied in courses that were originally not designed to be taught online. In this paper, we report on how we managed the transition from Face-to-Face (F2F) to ERT. We analyze the challenges and opportunities that arose in the process and discuss their potential influence on shaping the future of our teaching Landscape Architecture programs. The results presented in the paper are based on one semester (semester 1, February to June 2020) that was characterized by a New Zealand wide COVID-19 lockdown, which forced all universities to discontinue F2F teaching. However, this is just the beginning of a reflective process. The aim of this article is to bring forward the discussion about whether there is an opportunity for design disciplines to evolve in a new pedagogical direction where blended teaching methods can promote more effective teaching.

A BRIEF REVIEW OF THE LITERATURE

In this article, we will focus on the definitions, similarities, and differences between Emergency Remote Teaching (ERT), Online Teaching (OT), and Blended Learning (BL). The literature clearly defines them as three different approaches to teaching where OT needs careful planning, ERT is teaching online temporarily while following the same plan as F2F teaching, and BL is a hybrid form of teaching that mixes between physical and online interactions. In the field of Education, clear definitions have been set forward to explain the difference between OT and ERT. Charles Hodges and co-authors define these terms as follows,

"Online education results from careful instructional design and planning, using a systematic model for design and development. The design process and the careful consideration of different design decisions have an impact on the quality of the instruction."[1]

"Emergency remote teaching (ERT) is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances. It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated."[2]

In their book *Is K-12 Blended Learning Disruptive? An Introduction to the theory of hybrids*, Clayton Christensen and co-authors state that, "blended learning is emerging as a hybrid innovation that is a sustaining innovation relative to the traditional classroom. This hybrid form is an attempt to deliver "the best of both worlds"—that is, the advantages of online learning combined with all the benefits of the traditional classroom."[3] Blended learning, thus allows institutions to utilise advantages of online learning without interrupting the course structure and the faculty role.[4,5]

LANDSCAPE ARCHITECTURE TEACHING

Landscape Architecture is situated at the intersection of science and art with courses that focus on ecology, engineering, and plants, on one hand, and history, arts, and design on the other. Following the design culture, studio space is where most of the teaching happens, and it is where students learn to combine their acquired knowledge to come up with landscape designs that meet the client's brief. Digital tools have strong application in the practice of landscape architecture, though this can be strongly weighted to the production of outputs that effectively communicate a completed design. Studio practice continues to be strongly tactile in development and emphasizes practices of hand drawing in both sketching spatial concepts and developing effective masterplans[6]. In addition, Landscape Architecture is a site-centric program where some of the teaching takes place while in the landscape. Plant identification, project building, site visit/evaluation, and landscape assessment are some of the key activities that take place outdoors. Overall, an accredited program in Landscape Architecture combines theory, practical and studio courses. Each course is designed to not only be a comprehensive and self-standing course, but also to feed into other courses to meet the requirements of the profession.

In 1878, Lincoln University started as an agriculture college and has grown into an internationally recognized university comprising three faculties: Agriculture Sciences, Commerce, and Environment, Society and Design. Located in a rural setting, it is only around twenty kilometers southwest of the city of Christchurch. This unique location allows for a diversity of projects ranging from the urban setting to the rural setting with a diverse set of environments to work on.

At the School of Landscape Architecture (SoLA) in Lincoln University, the program consists of one introductory year, and three professional years – a total of four years. In each year, the courses are designed to help the students acquire new competencies while building on previously gained knowledge (Figure 1).

Before the pandemic, one course (a third-year course: Urban Design) had started experimenting with blended learning formats. Traditionally, urban design theory has been taught through lectures. The problem with this teaching format is that there is often only limited time left to do other activities, for example workshops or group discussions. However, research shows that such interactive and collaborative teaching formats promote so-called "deep learning" which is vital for understanding complex concepts[7]. In response, the examiner produced high-quality online content (including urban design short films) which helped free up lecture time, which could then be used for innovative learning formats such as LEGO workshops. These workshops follow a collaborative learning approach where students can apply design principles they have learned through online content (Figure 2).

All other SoLA courses were taught using predominantly 'traditional' F2F methods where teachers used a physical space like a classroom or studio for all student-teacher interactions. A common practice used at SoLA was the recording of the lectures to cater for the large number of international students whose first language was not English. In addition, the four years include many site visits and trips all over the country, some of which required an overnight stay to immerse the students in the landscape experience.

Figure 1. Overview of the accredited undergraduate Landscape Architecture program

Figure 2. Lego urban design workshop (2019). Photo: A Wesener

The teaching staff consists of eleven members, three part-time and eight full-time, with two Professors, one Associate professor, two senior lecturers, four lecturers, and two senior tutors.

LOCKDOWN AND MOVING TO EMERGENCY REMOTE TEACHING (ERT)
1. Lockdown and Choosing to Move to ERT

The year 2020 started with announcements from the World Health Organization (WHO) about a fast-spreading virus[8], and soon after, the whole world went into lockdown. On Monday 23rd March 2020, New Zealand Government announced a country-wide lockdown to be begin on Wednesday 25th March[9]. Like the rest of the world, no one was prepared, and most importantly, no one knew how to transition to online teaching. Early in the process, there was no clear platform that could be used, and the top two candidates were ZOOM and MS Teams. Working closely with the IT department at Lincoln University, it quickly became clear that MS Teams will be the best software to use to communicate and teach classes online.

As a department, all staff worked closely to maintain a consistent and coherent way to teach online. It was clear that ERT was the optimal choice instead of OT as there was not enough time to plan and prepare for a new way of teaching.

2. Teaching Practical, Studio, and Theoretical Courses under ERT

Three methods were used for ERT that are similar to the online education pedagogy presented by Barbara Means and co-authors. These methods are: "expository" (communication through video/audio or text); "interactive" (group working amongst peers), and "self-learning or independent practices".[10]

After multiple online meetings, all staff familiarized themselves with MS Teams and agreed to use it in similar ways across all courses to maintain consistency. Teaching resumed and classes were taught as they were initially planned, except they were online. Staff met regularly to share knowledge and

update each other, but quickly it became clear that some courses were working better than others. Everyone kept track of the challenges and opportunities that arose over the course of the semester and semi-structured online video-sessions were conducted and recorded[11]. ERT was a challenge mainly for digital and practical courses as they either were in the process of building a project on site or preparing for a week-long trip to fulfill the requirements of the program.

The 'Applied Landscape Practice' course relies heavily on being able to have students out on a site, implementing a landscape plan. When the course switched to ERT the students had completed only one assessment, a set of detailed design documentation, and the practical elements were planned to be carried out several weeks after the move to ERT occurred. Instead, this practical component and assessment was modified to become four, weekly tests that used material created specifically for the course. The course included DIY, or 'Do It Yourself,' videos from local suppliers, staff recorded videos of implementation techniques, methods of implementation, safety considerations, and a glossary. Therefore, practical exercises such as bridge building and testing were scaled down and modified so students could develop their own 'at-home' experiments for reporting.

A field tour to Queenstown, about 6 hours' drive south of Lincoln University, was cancelled because of the lockdown. An alternative field tour was required, one which students could do from their homes, wherever they were in the country. The DIY field tour required students to locate sites for study near where they live, which encouraged them to realize that designed landscapes are everywhere – streets, playgrounds, car parks – not just in special locations like Queenstown. Through sketching and analysis, the students critiqued the sites, working independently with the online guidance of the field tour leader. The students uploaded their drawings and commentary, revealing fresh and informed critical appreciation for the 'ordinary' landscapes in which they live.

Closure of computer labs during ERT created challenges for teaching software applications, as computers that were specifically set up for teaching were not physically available. This meant that students had to try to meet the specific licensing and resource requirements of the software on their personal computers. Computer labs were set up to allow students to log in remotely but working on these was considerably slower and not all software could be used remotely.

For studio courses, on one hand, they faced some obstacles due to the lack of interaction between students and staff. The experience of teaching designs studio projects during lockdown forced a rapid change to this understanding of the design process as online critique created several barriers to the role of sketching in design development and critique processes and its place in studio-based design courses. A significant challenge was identifying suitable techniques to model drawing and sketching in the design process. Ideation techniques that use trace paper in quick hand sketching proved most problematic to both demonstrate and also encourage students to adopt. Hand rendered work (project working drawings, site sketches and details had to be digitized using readily available downloadable apps. Subsequent issues with accuracy, clarity and scale meant review methods had to be adapted. On another hand, studio feedback sessions, conducted synchronously or asynchronously, turned out to work well for students and staff. Screen sharing of tablet platforms proved most adept at this, so while staff could use these techniques, many students did not have access or sufficient expertise in these tools for this to be effective. Some asked students to collate drawings in a single document, and they would control the viewing of the document, so they could move to specific sketches or parts of a masterplan and ask the student to discuss what was being developed. This method also enabled students and staff to interact asynchronously and at times that suited both parties. For example, students would post work up online and request a critique, and staff would provide feedback annotations on the collated works when they were available. Online presentations were also more

accessible to the wider public and many people could attend no matter where they were in the country and were particularly useful for more advanced classes.

Theoretical courses were the least affected by the online world in terms of delivering the content, they were taught either synchronously or asynchronously. The first allowed for guest lecturers to interact with students and for live question and answers sessions; the second offered students the ease to listen to the content at their own time and the allocated class time was dedicated for special topic tutorials with the students. Even with allocated time for direct contact, theoretical courses lacked in teacher-student interaction as students did not feel comfortable opening their cameras and microphones to ask questions or interact with the teacher. Another technique used for teaching lecture-based courses was the use of online chatrooms. Allocated times for live chat were set in advance, with the course lecturer online for the duration of the session. Students found these open sessions with direct access to the course examiner helpful for quick questions and short discussions. Chat threads were then saved for students who did not attend the session.

Providing online 'office hours' was also a useful approach to maintaining and strengthening the student/teacher relationship. Providing time one-on-one, or small group video calls, students could talk directly to the course examiner.

3. Barriers and Enablers of ERT

For the purpose of this article, the attention is on the staff's experience with ERT and not the students since it was not an opportune time for ethical approval. The data was collected over the course of recorded online meetings. Staff members were asked a series of questions about their experience using ERT and the different lessons learned. As mentioned in the previous section, ERT was a challenging approach to teaching in Landscape Architecture. This new method of teaching took an emotional and psychological toll on students and staff. Also, many students did not have basic time management skills, and keeping track of classes and assignments was a challenging task that many students struggled with.

Not only did the teaching staff have to teach using unfamiliar ways, but they also needed to learn how to use and master new software programs that they did not necessarily know before. Also, all teachers needed to find appropriate places in their households to be able to comfortably teach while having family members in similar situations, and children requiring online education support. In addition to all these issues, all staff were tending to students needs and worries by extending class times or contact hours which led to longer working hours.

By the end of lockdown, it was clear that ERT acted as a barrier to the traditional ways of teaching Landscape Architecture, but it also presented some opportunities that have the potential to be part of a new way of looking at landscape education. As a department, it was clearly an opportune time to start a discussion around blended learning approaches and how they can be beneficial for the discipline.

CONCLUSION - LESSONS LEARNED: LOOKING AT THE FUTURE OF LANDSCAPE EDUCATION

According to Clayton Whittle and co-authors, the Emergency Remote Teaching Environment (ERTE) Framework is "a conceptual framework through which teachers can plan and researchers can conceptualize learning in these emergent environments." [12] To evaluate the efficacy of the ERT experience, the Framework identifies "three [nonlinear and iterative] steps: inquiry, classifying available resources into constants and variables and designing educational experiences"[13].

In the case of SoLA, the framework helped in identifying courses that can potentially incorporate BL techniques. A total of eleven courses were selected and they all range from 1st year to 4th year

courses. These courses are currently testing BL techniques, and none of them are fully online courses, but all have the potential for both online and F2F teaching (Figure 3).

Figure 3. Courses using Blended Learning (B) Techniques

In the report *The Rise of K-12 Blended learning*, Horn and Skater describe six models for blended learning that are established in the learning experience of students which include physical space, teaching method, teacher role and curriculum planning[14]. We, however, present a reflection centred around the values that staff members have for transitioning to BL for their courses, which include widening access to material and instruction; supporting students with varied needs; improving student involvement by expediting small group and one-to-one teacher/tutor led instruction and adding variety to instruction to support learning of complex concepts.

Since the end of lockdown in New Zealand (July 2020), the department has been experimenting with different hybrid techniques: recorded lectures (synchronous or asynchronous), feedback sessions for studios and tutorials, project presentations, and assessments. Software tutorials were all pre-recorded and made available online, which meant students could follow along at their own pace. Students appreciated this aspect, and as a result this is something that has been implemented in our courses after ERT and as part of new BL methods. Next steps will include further evaluation of these methods and to measure students' satisfaction.

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EDUCATION IN UNCHARTED TERRITORIES: NAVIGATING THE DIGITAL EDUCATIONAL SPACE

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INTRODUCTION

The past twelve months have seen educational institutions around the world, from Early Years (EY)[1] all the way through Higher Education (HE)[2], striving to respond to the challenges imposed by the COVID-19 pandemic in order to attend to the educational needs of children and young people. Educators have found themselves working in uncharted territories while getting accustomed to a number of changes pertaining to institutional practices and personal experiences. This paper was born out of our interest in sharing our experiences, the challenges we have been and still are encountering as well as our small victories while trying to adapt to a novel understanding of HE. Within this context, practices of online learning, remote teaching and virtual meetings have started to dominate the day-to-day HE experiences as well as our own casual conversations. It is through these conversations that we realised how our experiences as two young female academics working in different fields, that is education and architecture, started to overlap. Aiming to bring together theories and practices in an interdisciplinary approach[3] that mirrors our current mode of working, we co-designed and co-authored an experimental dialogue between ourselves, and by extension between the two fields.

Our dialogue reflects an appreciation towards interviewing as a social practice and as a process that enables the social production of knowledge[4]. This dialogue has also been an exercise in reflexivity, which goes beyond reflection and allows for conceptualisations and transformative practices within the classroom[5]. We wished to create a collegial and supportive space which would enable us to explore the process of digital writing as a "collaborative, live interaction -one in which users often co-create digital artefacts in real time- that is rare in traditional writing"[6] . A shared document with four questions was created which we started populating with responses, reactions, notes, comments, jokes in a rather organic way between June 2020-March 2021. The document (see Figure 1) soon transformed into a dialogue both responsive and reactionary which accumulated different layers of our sharing and thinking process.
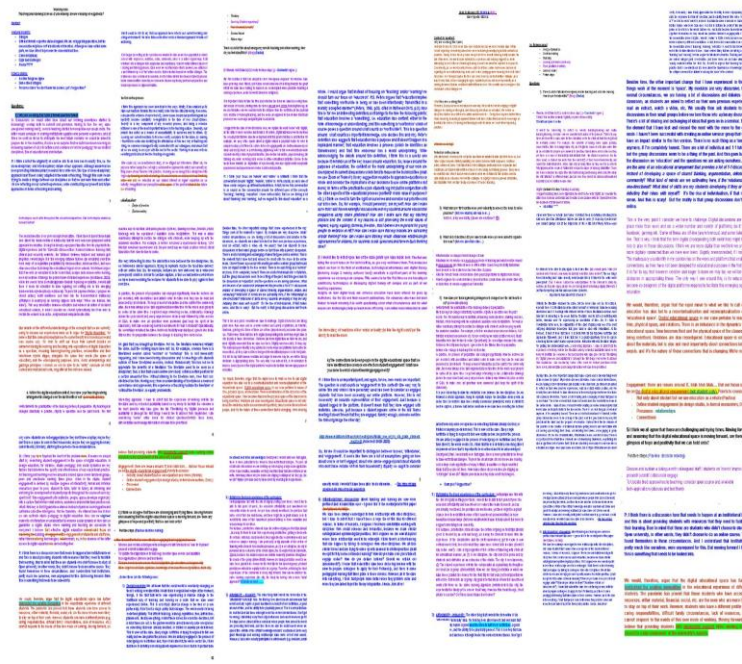
Figure 1. Visual record of our page(s) as generative site(s) of negotiation.[7]

Each week we revisited each other's answers, we edited our own and followed up with a 'live' video session that extended beyond our written dialogue. The dialogue which we present here does not intend to conclude, but to further disturb the blended dialectic process while also locating commonalities shared by our otherwise diverse day-to-day professional practices and personal experiences in HE.

In what follows we are presenting our discussion focusing on four areas: a) the limitations of concepts such as 'remote' and/or 'online teaching and learning' and an argument for 'digital education', b) our shared understanding of what we call 'digital educational space', c) the importance and nature of student engagement within the digital educational space, and d) the affordances of this new reality that may inform our next steps. We have also included the questions we used in our guide to help the reader navigate our discussion. We chose to not identify the person who is speaking every time (although often this is obvious) as we would like to invite the reader to draw on our experiences and reflect on their own irrespective of their field of practice.

TEACHING AND LEARNING WITHIN THE DIGITAL EDUCATIONAL SPACE
There is a lot of talk about emergency remote teaching and online learning. How do you feel about this?

It is important to take time and reflect on the terms we have been using for teaching and learning the past year, starting from the use of 'remote' and 'online'. I think both the distance from the institution as the physical teaching location, and the lack of the face-to-face traditional teaching we facilitate in academia, should be considered.

To start with, I suggest we replace the word 'online' with 'digital'. The latter appears to be more inclusive, by encompassing the non-physical we have been deprived of during such times. In architectural education, we often speak about digital or physical models to refer to complementary, yet distinct forms of generating ideas and interpreting our built environment. Similarly, 'digital' in this context could refer to this new educational realm characterised by a lack of a physical location,

face-to-face interaction, making etc., while addressing both online and offline educational activities. While 'online' tends towards an implication of synchronicity, 'digital' could incorporate both synchronous and asynchronous modes of education.

The conversation around 'digital', 'remote', 'online' is for me as important as the conversation around the concepts of 'teaching', 'learning', 'education'. I have noticed lately that we are talking a lot about 'teaching' and 'learning', which in my mind emphasises the process and the technicalities. However, I would argue that we need to backtrack here and consider the wider picture, which would also involve a discussion around the aims of education[8]. My suggestion would be to approach education holistically and consider the implications of our decisions to use online platforms not merely in terms of the technicalities (e.g. which platform is the best one?) but in conjunction with the other aspects of the educational process (e.g. What is education for? What are the moral values that underpin the educational process?). So, for example, I would personally ask myself: *How can I make sure that I still have meaningful discussions with my students around educational inequalities using online platforms while cultivating critical thinking? How can the virtual classroom provide opportunities for debates, for students to ask questions and have in-built thinking time?*

This makes me reflect on two things; firstly, in architecture, technological affordances and digital literacy (including design/making software) constitute a significant part of the learning experience we encourage on campus. This is, however, the first time we scrutinise technologies and discuss digital literacy as part of our educational practice off campus. Personally, I am intrigued by what technologies could offer in this educational spectrum. *Could technologies enable us to teach better?*

Secondly, a holistic approach to education could successfully address issues around the teacher-student relationship. During this abrupt, unprepared transition from the physical to the digital experience, the 'distance' between teachers and students is amplified. It is this emerging distance that we -educators- should be more wary of; this separation precipitated by disconnections, misconnections, and slow connections that disrupt the 'signal' of our educational network. This emerging practice of digital education calls for a shift in our role. As Veletsianos suggests, if educators wish to better understand and enhance online learning, they must examine it through the point of view of student experience[9]. The association between educators and students, both actors of a shared network, is what I argue we should systematically fuel if we wish to sustain the educational network in an active, reciprocal and compassionate state.

Minor conclusion 1

Our debate on the different understandings of the concepts we are currently using to discuss our experiences leads us to argue for *'Digital Education'*. We believe this conceptualises the current reality in a more inclusive and less elusive way. We wish to shift our focus from current debates on online/remote/digital learning and teaching into explorations of Digital Education as a spectrum, including teaching/learning practices, online/offline and their in-between hybrid stages, alongside the space they create (the space of education), the encompassing purposes, aims, moral underpinnings and guidings principles.

Within this digital education context, how have your teaching/working arrangements changed over the last year?

My initial arrangements for delivery were defined by a reactionary attempt to sustain the dialogue with students while keeping up with academic deadlines and curriculum requirements. Lectures were delivered in a synchronous mode and so were, 1-2-1 tutorials; a rather literal translation from face-to-face to screen-to-screen teaching. As the confidence in our deployed tools grew, we became more

experimental: lectures were pre-recorded with additional notes and reflective tasks to increase levels of accessibility and engagement, and new methods of designing through collaborative improvisation as a way to sustain interaction among the year group and the keep the spirit of our studio community alive were explored. Overall, working arrangements included longer hours of preparation and contact with students, faculty and teaching staff. Timetabling my 'digital' presence and availability is a lesson I have learnt, and I will apply in my future practice. I admit I now appreciate the affordances of our informal encounters on campus more.

Besides time, the other important change I would like to point out is in regard to 'space'. Within the traditional classroom environment our students are prompted to contribute to discussions, reflect on previous experiences, work collaboratively, participate in debates, and be creative. Our modules are very discursive. There's a lot of sharing and exchanging of ideas that takes place within a seminar, for example. Cultivating this kind of exchange within the online classroom has been one of the challenges that I have been trying to overcome this past year. This discursive element of our teaching is essentially linked to the way that I understand education, its aims and its purposes, and ultimately to my ambition to empower young people to develop a critical approach. I suppose my question here is *how do we operationalise the online space towards this direction?*

Digital interaction, either synchronous or asynchronous, takes place more than ever on a day-to-day basis and on a variety of platforms (twitter, instagram, facebook, gaming environments etc.). As a community, we are more digitally literate and connected than ever; slightly overconnected- if I may say. The inadequacy you identify, in my opinion, lies on the platforms that enable connections in this digital realm, as they have not been designed for educational purposes. As a result, however creative and eager to learn we may be, we do face obstacles in appropriating them. For example, our ability to 'read the room' in this digital educational space has been constrained. The only way I see around this, is for educators to become co-designers of the digital platforms required to facilitate this emerging space of digital education. A space where students are not taught what to learn but how to learn.

Minor conclusion 2

We therefore argue that the rapid move to what we call digital education has led to a recontextualisation and reconceptualisation of the 'educational space'. Digital educational space in our case pertains to issues of time, physical space, and relations. There is an imbalance in the dynamics of the educational space. Time becomes fluid and the physical space of the classroom is being redefined. Relations are also reconfigured. Educational space is not only about the materials but is also and most importantly about relations between people which are being recrafted. We are missing the immediacy of reactions either verbal or bodily/corporeal or the ability to read the room.

The relations between people in the digital educational space that we have identified have a knock-on effect on student engagement. How have you dealt with issues or concerns around student engagement?

This is an important point, and again, for me, here words are important. The question is what counts as 'engagement' in this context? One easy way to define this has been to consider as 'engaged' students that have been accessing the online platform. However, this is not necessarily an accurate representation of their engagement. Logging in does not necessarily imply engagement with materials. So, for me it would be important to distinguish between 'access', 'attendance', and 'engagement'. It seems like there are a lot of assumptions around engagement that would need to be unpacked.

You have touched the heart of the problem. We should re-define student engagement in the space of digital education. For instance, in studio pedagogy, social dynamics are a key factor that determines

the quality and effectiveness of our practice. Both teaching and learning revolve around a shared space where hands-on group, peer and one-to-one learning take place. When in the studio, student engagement is defined by multiple degrees of interactivity, formal and informal encounters, all contributing to the development of student projects. This engagement with materials, people, space develops organically into a culture that mirrors what seniors, academics and design practices do. Moreover, it guarantees shared instead of parallel learning paths and cultivates collective intelligence. For me therefore, the interest here lies in how we can cultivate studio pedagogy in digital education. *How can we guarantee a digital studio where learning and teaching remain accessible to everyone? How can we engineer moments of interaction or collaboration to enhance social dynamics?*

Minor conclusion 3

Defining and cultivating <u>student engagement</u> within the digital educational space is a crucial matter. As educators our interest lies in creating an educational space where students would not only be passive recipients of knowledge but would be actively participating in the production of knowledge. Teaching in a physical classroom or a studio enables us to create the conditions of a shared learning practice where students and educators collaborate and participate in a mutual exchange of ideas. The question is: *How can we create such conditions within the digital educational space?*

Moving forward, are there any lessons learnt that we can take with us?

I think that we are currently experiencing a substantial change in the traditional way of teaching and learning on a scale that we have not experienced before. The HE sector is being re-defined and reconfigured globally. As educators we are actively engaged in the process of redesigning our own practice, our institutions and, if you think about it, the whole sector. So, I think this is a very important moment of empowerment that is important to be mentioned and to be acknowledged here which prompts us to revisit crystallised practices and understandings of HE. At the same time, I believe this context fosters opportunities for interdisciplinary discussions. I think there's a lot of learning that can happen by talking to colleagues from other disciplines and other institutions as we are trying to figure out our own position and reshape our practice within this uncharted territory of the digital educational space. This e-dialogue, for example, has provided us with the space to push all small-scale discussions we are building up into shaping a large-scale application of the many creative, innovative or simply revisited ideas that are out there as we write.

Within this context, rethinking the lived experiences of the curriculum is crucial. For instance, architecture students have the culture of going on field trips as a way to learn from experiencing architecture in the cultural, historical and social context it is situated in. Such opportunities undoubtedly enrich and extend on-campus teaching. I am an advocate of the culture of travelling with students for educational reasons, as in our discipline, the city is perceived as an extension of the studio space; the concept of city as classroom, while this shared experience outside university premises strengthens the bonds between students and staff. Virtual field trips have been implicated by universities as the alternative, however I am interested in exploring new ways to address the lived experience by looking into a more 'local' approach. In many cases and for a long time the 'local' has been overlooked at the expense of the search for the 'exotic' other, so this might be a good time to prioritise the local 'other' as a way to extrapolate and communicate new qualities of the 'sites' we already inhabit.

Minor conclusion 4

While HE as a sector has been frequently described as an uncharted territory with bleak colours, we wish to consider the possibilities for empowerment that are offered within this territory. Developing interdisciplinary discussions that can help us reflect on our practices, revisit and reshape well-established understandings and approaches are ways that can support us as we are grappling with the different aspects of the digital educational space. Similarly, rethinking ways to reconnect with the local communities while still operating within a global framework may become one of the vehicles of innovation and change.

CONCLUSION

This work has been based on the premise of writing as 'unavoidably a material, technological, social practice that 'does things' between people[10]. This reflective collaborative writing exercise has created a liminal space of ambiguity and re-negotiation, which further facilitated a process of exchange while constructing our present and future approaches in terms of teaching and learning. It is this element of interaction, the intertextuality that incorporates our voices that turns the digital page into a dynamic and generative site for negotiation between our disciplines and us allowing for an interdisciplinary reconceptualization of HE. Predicated on fluidity and adaptability rather than constancy and conformity[11], our interactive text can be seen as a mirror of the modus operandi of our past year in our practice of digital education.

Sharing our experiences of teaching and learning online, the effects of this online approach on practices and relations, as well as on our own understanding of ourselves as educators within HE, enabled us to conceptualise and articulate how 'digital education' better represents our current experiences; not only because of the affordances of the word digital (as opposed to 'remote' or 'online') but most importantly because of the central position that is given to the concept of 'education'. We have argued for an understanding of 'digital education' as a spectrum which incorporates practices, spaces, aims, moral underpinnings and guiding principles. We have tried to conceptualise the digital educational space as a field where the traditional configurations of time, space, relations and student engagement are being redefined. This digital educational space offers opportunities for interdisciplinary discussion and novel ways of working (e.g. connecting with the local communities) which may not have been at the heart of our previous approaches. Such innovative collaborative activities may become a valuable source of inspiration that can support us in our aim to educate our students so that they become citizens that would contribute actively within a global social context.

ACKNOWLEDGMENT

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BEYOND THE SWITCH: MAKING LASTING IMPROVEMENTS TO ONLINE COURSES

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INTRODUCTION

How to engage students online? What technology will help? These are essential questions. Engagement is critical to learning, and the online environment poses challenges that on-campus courses do not. Engagement is obviously easier and more intuitive when face-to-face. Personal presence, eye contact, body language, and physical proximity are means of fostering connections and communication. On the other hand, online classes are physically remote, and visual cues are limited, or impossible when cameras are off. Other key drivers of engagement, such as curiosity, attention/focus, and social interaction among peers are also challenging in remote learning environments.

In-person studio instruction is based on long, intense face-to-face interactions with faculty and peers. As a pedagogical system, in-person studio-based education works well. In fact, non-studio curricula are transforming to be more like studios (project-based learning, flipped classrooms) and moving away from their own traditional pedagogy ("sage-on-the-stage", lectures in class and homework at home). This is a testament to the studio's success as a means of in-person engagement.

However, the pandemic brought a swift end to such classes, so methods to engage students must adapt to meet the virtual learning environment. Universities were not equally prepared to make this change. Some architectural colleges were successful in making the emergency switch in Spring 2020, and those with pre-pandemic online programs were advantaged as they could build on existing expertise to manage the transition.

The dynamics of online education may sound familiar. In remote learning environments student focus wanders due to abundant distractions. As a result, students may feel lost and/or uninterested in the course material. There is less time spent discussing course material with peers, and there is less time spent with peers, period. The inherent social isolation makes learning difficult. As interest drops, students may want to complete only the required course work for the sake of finishing, and student motivation becomes extrinsic, with concern for grades paramount. When this happens, student engagement withers. As a result, faculty may become demoralized, negatively impacting their attitude towards the course, students, and administration. In response, faculty are eager to try something new, yet feel overwhelmed by the abundance of technologies and app choices, and may end up choosing hastily and unconsciously in a quest to engage students. Some may find apps that improve interaction, yet don't improve learning outcomes. A poor choice in technology has the potential to do the wrong things well.

Being among those who developed an online program from the ground up eleven years ago, I offer lessons (hopefully valuable) from the unique perspective of creating courses during a time with relatively few technological options. Today, there are more technologies available, and searching for the "right" one has become an obsession and misses the forest for the trees. The primary objective of technology must be 1) skill development, whether that be critical thinking skills or design process, and 2) engagement. You cannot have one without the other. By recognizing that technology is a supporting actor, classes can become more engaging by using non-technical techniques, crafting the course structure, creating varied activities to inspire curiosity, and then finally, choosing technology wisely to improve course outcomes.

NON-TECHNICAL TECHNIQUES FOR ENGAGEMENT

Having started teaching online at about the same time the first iPad was released, the most popular phone was the 3G S iPhone, and Foursquare was not yet forgotten, I had the opportunity to improve learning outcomes without recourse to today's abundant technology[1]. I consider this as an opportunity because class engagement needed to be provided without the tech, which can be overwhelming and confusing. Instead, the tools available were: improving pedagogical frameworks, course organization, collaboration, and student interaction. To this day these remain the primary tools of engagement. Technological solutions are important, and more are still needed, but these should remain in a supportive role.

Isolation is detrimental to learning. In the past, drop-out rates for online courses were shown to range from twenty to fifty percent and are about ten to fifty percent higher than face-to-face courses[2]. Interaction between classmates and the professor are shown to be highly determinant factors of satisfaction and engagement[3]. But, it can easily become lonely as students encounter obstacles that would otherwise resolve with the comradery usually provided in on-campus studios, including the interaction with the professor. Despite the obvious fact that online students are physically isolated, remote learning need not be an isolating experience.

Professor-student communication is essential, and can easily be adapted to online. This can begin at the beginning of each class, where my experience has shown that simply greeting students by name and checking in with them to see a smile starts the class off well[4]. Roberto agrees, writing the first ten minutes of class are essential to grabbing attention and personal interaction can simultaneously reduce isolation and attract focus[5].

Without personal professor-student nor student-student connection, engagement remains low and curiosity is difficult to inspire. Direct and live discussion remains essential to education for several reasons. First, the time it takes between a question and its answer is critical to learning[6]. More immediate responses lead to better learning outcomes, because working with a question while it's fresh is when the mind is open to hearing an alternative. Second, connecting the course content to preexisting notions, ideas, assumptions, and beliefs helps the content to become meaningful to the students[7]. None of these suggestions require additional technology.

STUDIO STRUCTURE

"Attention is scarce and fragile" – Cal Newport

Faculty are in competition for students' attention with a slew of distractions, from housemates, to family, to social media. However, a highly crafted course can keep students engaged despite these strong counteracting forces. Architects (and allied professionals and educators) are accustomed to counteracting wind, earthquakes, and other forces that could cause failure. Similarly, a structured course is deliberately designed to counteract distractions. As with landscapes, buildings, and interiors,

a "course environment" can use composition, paths and circulation, rhythm, and tectonics to engage students from one class to the entire semester.

Small assignments can build on others to create a larger assembly of work (tectonics), and this work can be more engaging by including both collaborative and individual components. For example, in one of my courses students complete a scenario planning exercise where they create four future worlds based on key drivers together as an entire class. These worlds are co-created and become a shared component of the project across all teams. They then break into their teams and use the worlds to propose their own approach that will perform well in the potential worlds, "future-proofing" their building and site designs over the long term.

Other research suggests games, activities, or "anything that breaks the monotony of the flow". Suggestions are to include simulations or competitions to "keep excitement and engagement up" [8]. Or, using breakout rooms and having students share their screens and work. The key is to vary the rhythm of the course. Figures 1 and 2 show "choreographies" of activities at the scale of a semester and a class.
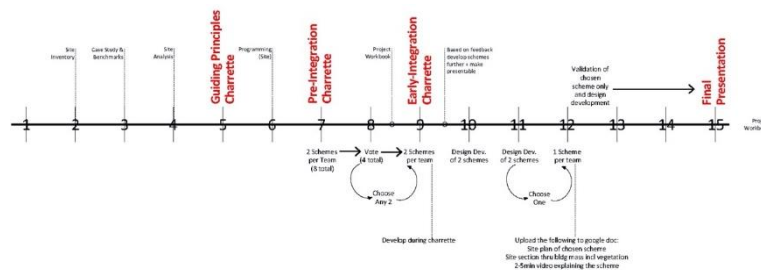
Figure 3. Semester-Long Activity Planning

Figure 4. Class Activity Planning for Classes of Different Lengths

I find that when design educators approach their courses as environments to be designed, they craft highly creative and engaging courses[9]. Over and over, I find that students tend to learn more with a highly structured course than one with an open-ended discovery process. It keeps them focused on the course material and skills needed to reach the learning outcomes.

A common counter argument is that highly structured courses diminish a studio's open-ended discovery that leads to insights and creative solutions. Time together must be meaningful and intentional, and in this way, it must be planned. Such planning does not eliminate exploration, insights, and creativity, but focuses and guides them. For example, breaking larger projects into mini-assignments and inviting students to revisit and question their work on previous assignments[10] supports discovery. Once embraced, faculty see the benefits, and some revise their on-campus courses to be more structured after teaching online.

ACTIVITIES

In addition to varying the types of activities during a class, the activity itself must be engaging and spark curiosity. Among the most engaging activities used in my classes are 1) modeling specific design and thought processes, 2) charrettes, 3) games, and 4) hearing from other experts.

Modeling Process and Outcomes

Modeling processes is an excellent means to demonstrate techniques and can reach those who learn in a different way. For example, I demonstrate how I would start to design a passive building that incorporates adaptive opportunities. I draw in front of the class while talking aloud about considerations in the moment. Wind directions, sun paths, user circulation, formal considerations to enable natural ventilation and daylighting, etc. are shown. While I draw, I change my mind about the site plan, floor plan, and building section. They experience not only the content I'm considering, but also how I'm considering it (elements across time, scales, etc.). This helps students to grasp, apply, and embody the design process in a way that's different than other class activities. The technology needed to do this is simple: a camera, Zoom, and PowerPoint – all pieces of tech that faculty already use. Being online, this can be recorded so that students can revisit it. It also provides the faculty with an asset to refer students to later.

Charrettes

Another popular activity is the use of charrettes. These are intense, short design events that are used to explore a specific design task. I use a charrette for initial stages of site development and placing buildings on site. I've developed a specific design process using the four quadrants of the Integral Framework[11] that aids in this process, and helps create a more holistic design outcome in the time-limited process. Student teams create one proposal for each quadrant that exemplifies the characteristics of each quadrant (experience, culture, performance, systems). Later, individually, they synthesize these into one proposal. This a highly engaging collaborative process that then feeds an individual, deeper design process later.

Because I used charrettes in a deliberate, small-scale way where I was able to test them as I used them, I was able to make changes to the process before I deployed them in other courses. One of the most valuable lessons I learned from this was the upper limit to the number of charrettes in one class before "charrette fatigue" set in[12]. This gave me the opportunity to create a new in-class activity to achieve a better outcome.

The charrettes were, and still are, a technological challenge. I currently use several different software to achieve them, including Prezi, PowerPoint, Excel, and Zoom. I still have not found the ideal software to achieve the process and outcomes I envision for the activity, but I continue to explore and use these in the meantime. However, the goals of tool choice remain 1) to inspire curiosity, 2) to provide meaningful interaction, and 3) to meet the outcome I want. Despite the (current) lack of an ideal tool, the one I've pieced-together works well. Furthermore, I avoid the trap of choosing tools that would lead to poorer outcomes and lackluster interactions.

Games

Perhaps the most fun activity is games. Play is a powerful learning tool[13] that is gaining popularity via the trend towards "gamification". I use game play to explore the common underlying dynamics of most climate issues: perverse incentives that deplete shared public goods. Although the game is about fishing, it applies to the built environment's impact on pollution and resource consumption, and the game play challenges students' behavior as they grapple with how unseen systemic incentives drive

their actions, often in ways that conflict with their personal values. This game is interactive, fun, and tends to have a significant impact on their learning. Furthermore, this requires no more technology than sharing my screen with a spreadsheet in Zoom. In Figure 3, you can see one team leader's expression as she discovers her team overfished during their first turn, forcing them to start again. We explore the dynamics of complex systems and game theory to comprehend how well-meaning interventions may have surprising and undesirable outcomes. For example, we talk about how technological improvements in building systems meant to decrease greenhouse gas emissions could end up increasing them instead, just as advances in fishing technologies can deplete fishing stocks faster. Students begin to argue that in addition to energy efficiency improvements, incentives must also change to realize sustainable and regenerative outcomes. Students' curiosity and engagement clearly increased. Third, this shifts the locus of motivation from extrinsic to intrinsic, where students are learning as their experience of the content becomes relevant and meaningful.
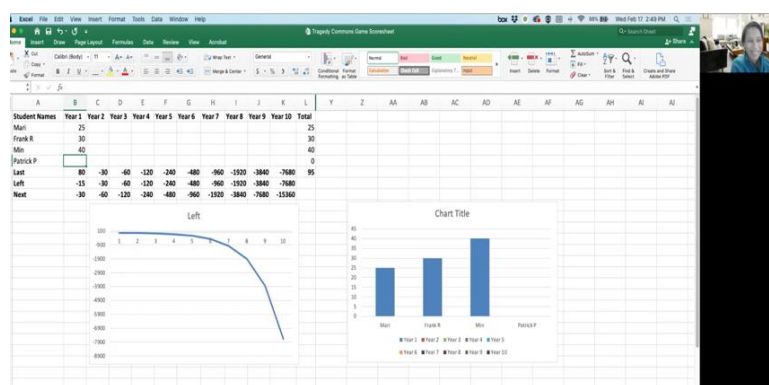
Figure 5. Screenshot of Gameplay

Interactions Across Space

As I mentioned earlier, being online gives the opportunity to record interactions, and it also permits personal meetings across space. I'm able to invite guest speakers for informal discussions with students that would not have been possible before given time and budgetary constraints. This also has implications for site visits. When students are unable to visit a site, a recording of a site tour and other software (such as Google Earth) brings the site to the students instead.

HOW TO CHOOSE TECHNOLOGY WHEN YOU'RE READY

Technology can support curiosity and intrinsic motivation by developing students' skills and making it engaging. These two goals should be used to thoughtfully choose the right tools.

However, faculty often choose an app or software as an almost unconscious reflex and may feel pressure to add technology for its own sake, or to have "current" and "relevant" courses. Unfortunately, unconscious tool choice can be ineffective[14]. To choose a tool thoughtfully, one could ask, "What tool would best serve this activity or outcome?" It may be there is a digital tool that fits the situation well, even one that's relatively "low-tech", like an Excel spreadsheet. But, it's essential to first understand why you want to use it. It's then easier to answer what tool to choose, how to use it, and when.

Research by Newport, a computer science professor at Georgetown University, has led him to propose the notion of Digital Minimalism, and among its principles are to ask the question of any technology, "will this add significant value?"[15]. In remote teaching the significant value of any technology is if it will help students realize the learning objectives for the course. As Grushka-Cockayne writes, "Don't

get caught up on the tech" and instead reminds faculty to "focus on the [course] content"[16]. The ability to achieve outcomes is greatly enhanced by creating a learning environment that minimizes distractions and engages students' creativity in a supportive yet challenging way. Some questions to help guide technology decisions for a course are 1) Why am I looking for this technology; and 2) What do I want to achieve with it?; 3) How will students use it?; and 4) When should I use it in the course?

Additionally, it's important to test and experiment before making big changes. The study of complex dynamic systems reveals a truth: it's difficult to understand systems, and making large, sudden changes will create additional problems that are more difficult to solve than the ones we were attempting to solve in the first place. This applies to the ecosystem of courses. Instead, small changes permit rapid feedback, allowing corrections at any moment. If the change is successful, then it can be scaled-up and integrated over time.

When it comes to the educational system, including our courses, this kind of approach can also help to avoid feeling overwhelmed by the abundant choices of technological solutions. It allows the instructor to stay focused on the content and students, which are the priority. As Grushka-Cockayne writes, "It's fine to experiment with teaching tools, but take it gradually; see what works, and don't try too much too soon. Simplicity has a lot of power"[17]. Making large, sweeping changes risks a semester's failure and setback, and can demoralize the faculty and students.

A cautionary tale: spending too much time on solving technological issues creates frustration and quickly drains energy and attention. When I first started using online charrettes, I could not get a piece of critical software to work, and spent too much time trying to fix it. The night's events went overschedule, caused a lot of frustration and stress for everyone involved, and I ultimately had to reschedule. This happened despite testing the software ahead of time. Simple is better.

CONCLUSION

To make course changes that endure beyond the emergency switch to online requires more than a technical solution. By recognizing that technology is a supporting actor, classes can become more engaging by using non-technical techniques, crafting the course structure, creating varied activities to inspire curiosity, and then finally, wisely choosing technology to improve course outcomes. Choosing software and apps for an online course is necessary but not sufficient to create a course that students find meaningful. The primary focus for engagement is connecting personally with students, structuring a course to withstand the hurricane-like forces of distraction, and developing activities that spark curiosity. The secondary focus is technology that supports these activities, even if the tech used is pieced-together from multiple software. Of course, it's important to keep looking for software that fits your needs.

These lessons learned are from my personal experience, research, and some are anecdotal. The research conducted to support these claims is based on one semester-long study with a limited number of participants. However, it is bolstered by similar findings from other research.

It is essential for educators to design an educational environment with the opportunity for students to experience the importance of the course content and to see how it's relevant to their own craft, career, or life. Despite the course being online, these outcomes are possible with quality, personal interaction, which poorly chosen software can impede. When faculty are inspired and curious themselves to consider the development of their courses as they might design another environment, their courses become well-choreographed, challenging, engaging, and fun. Faculty enjoy teaching it, too, and may come to appreciate the opportunities online education presents.

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HANDS-ON ONLINE: CHALLENGES AND LEARNINGS FROM TEACHING LANDSCAPE MATERIALS AND FABRICATION FROM THE KITCHEN TABLE

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INTRODUCTION

The learning of practical skills, enabled through making and experimenting, is indispensable in design education. Digital and manual prototyping is used in this context for students to evaluate different stages of their designs. Very often, prototyping methods presume an understanding of the materials used – their workability, constraints, and potentials – which goes beyond properties commonly referred to in generic material specifications. In landscape architectural education at the University of Hong Kong, learning on materials was previously often investigated primarily theoretically. Recognizing this deficiency, a range of courses – amongst the here discussed Landscape Media Seminar – have stressed the importance to create opportunities for experiencing, testing, and evaluating materials hands-on over the past three years.

Between the submission of the abstract to this writing until its publication an eventful year has passed leading to debates on the future of tertiary education and online teaching. A year ago, the realization that this pandemic will and should have a remaining influence on our visions of Landscape Architectural education only slowly began to solidify. This paper investigates the learnings from experimental working with materials, starting from conventional classroom education in 2019, to the setting up of 'home-fablabs' in March 2020, resulting in the current initiative of the TAL-L materials library.

TEACHING MATERIAL EXPERIMENTATION

The here described landscape media seminar is core to the Postgraduate Diploma in Landscape Architecture (PDLA), a new one-year degree for students who do not yet have training in the design fields. It is intended as a preparatory degree for the Master of Landscape Architecture (MLA) program. The course introduces essential digital and manual tools for design and representation in landscape architecture. Students explore techniques in material testing and digital fabrication as an iterative part of a design process.

First efforts to structure this course were initiated to tackle superficiality of specifying materials, particularly in design studio projects. The fact that we can see hardly newness in students' projects in terms of material innovation is little surprising looking at designed landscapes in the urbanized areas of the city. Many of Hong Kong's urban landscapes are dominated by unimaginative hardscape with

little attention to design site-specifically and taking into account concepts of sustainability, fabrication and construction practices. Therefore, a leading question to frame this course was structured around how to teach construction materials in an elaborated and landscape specific way.

In the first iteration of the seminar in 2019, students were asked to work with 'typical' materials, such as concrete, resin, wood or aluminium. All materials were introduced along with the university's workshop facilities. Following a short design exercise, students experimented within that predefined range of materials. They learned about workability of materials and tools and executed 1:1 prototypes, but there was little exploration and experimentation beyond the set brief or instructor's suggestions. After a reflective discussion with students of this cohort, material testing and experimentation was front-loaded and the number of in-class workshops giving practical instruction increased. (Figure 1)

These workshops around materials and digital technology were structured to provide sufficient guidance on foundational skills from the teachers' side but also to allow for more room for experimentation and feedback from fellow students. Peer-to-peer learning is particularly valuable in this program with students of different expertise. The approach of multi-layered feedback was aimed to equip students with transferrable skills to be applied in this course as well as in their studio projects. The process-oriented learning incorporates an interplay of thinking and doing with classes structured to allow students to test and apply their gained skills and knowledge instantly. The better understanding and extended timeframe to learn about both materials and tools was projected to increase the willingness of students to undertake more speculative material experimentations in future course iterations.
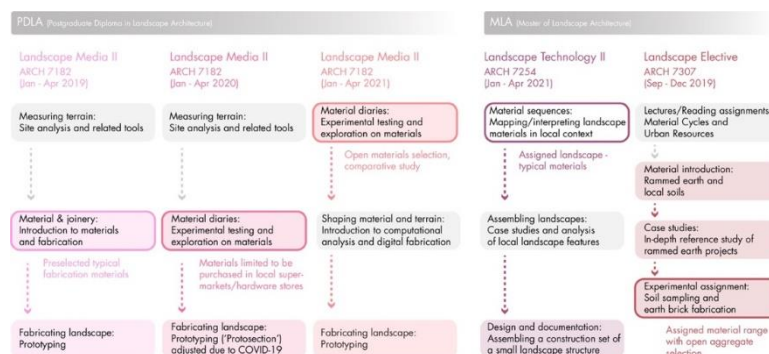
Figure 1. Courses taught by the author in the materials & technology stream of the PDLA/MLA programs in the HKU Division of Landscape Architecture

'HOME FABLABS' & DIY MATERIALS

In Hong Kong, the transition to pandemic-related online teaching started already in January 2020 only one week into the spring semester. In the first stage, ad-hoc adjustments were made reacting to the weekly updated recommendation from the university's 'Task Force for Infectious Diseases'. After two weeks of class suspension and first trials of zoom classes, teaching was switched entirely to online mode around four weeks into the semester and courses with requirements to use the university facilities needed to be adapted.

The learning benefits demonstrated in the 2019 cohort of this seminar were the decisive factor to carry out the 'Material Diaries' exercise without physical access to fabrication labs. Students were encouraged to set up 'Home Fablabs' with minimal means to manifest and facilitate learning through the immediate approach of crafting.

The adapted course brief restricted material sourcing to supermarkets and neighborhood hardware shops asking to compose materials suitable to potentially fabricate objects designed in an earlier exercise of this course. The resulting DIY materials established a new layer to the design work of the students and transitioned the learning about materials from simply following practical instructions to generating their very own material experiences.[1] DIY Materials, as defined by Rognoli et al., can be totally new materials, or modified or further developed versions of existing materials.[2] To enable this prompt creation of materials, students tested online recipes or modified existing material studies to suit the local context. (Figure 2)

*Figure 2. DIY material experiments: 'corncrete' samples
by YEUNG Hei, Marco, ARCH 7182 'Material Diaries', 2020*

The very local availability of resources increased the variety of materials explored with students suddenly located all over Asia. At the same time, locally varying outcomes of similar experiments resulted in wide range of different observations and enabled conversations in the virtual classroom about the influence of the lab setup as well as environmental factors such as relative humidity and temperature on the material behavior. While for example a bioplastic experiment with comparable ingredients and setup would achieve satisfying outcomes in Taiwan, (Figure 3a) the samples in Indonesia would mold almost overnight and before the mix was properly cured. (Figure 3b)
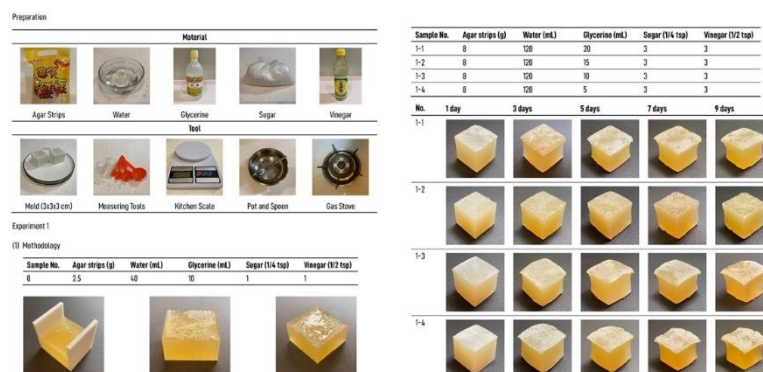
*Figure 3a. DIY material experiments with agar-based bioplastic,
by CHIU Yuan, Karen, ARCH 7182 'Material Diaries', 2020*
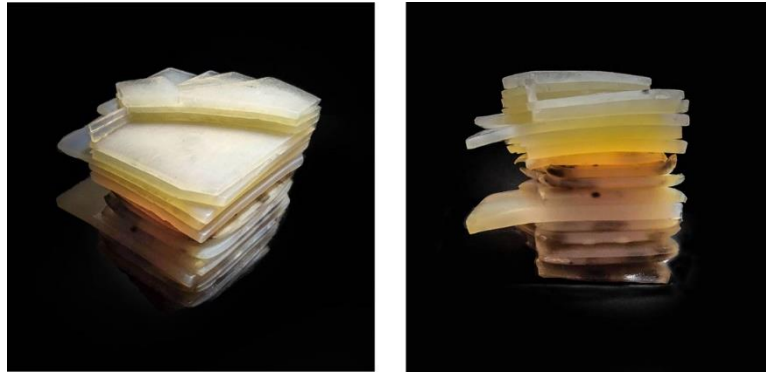
*Figure 3b. DIY material experiments with agar-based bioplastic,
by INTANU, Reyner, ARCH 7182 'Material Diaries', 2020*

Test setups imitating those of applied science environments were used in this course as a tool to inform and describe design processes.[3] Material failures, challenges and confusions which accompany this process were summarized in the 'Material Diaries' and other graphic reflections and made available to fellow students. (Figure 4) The exploration of this extended material qualities unveiled in this exercise was used to discuss and understand wider concepts of sustainability, urban resources, as well as fabrication and analysis technologies. Students assessed their design decisions based on the adapting conditions and speculated on how to reintroduce these mostly atypical materials to potential landscape projects.
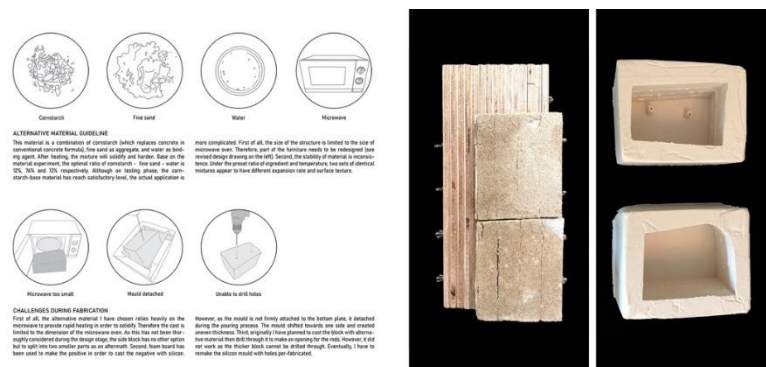
*Figure 4. Graphic reflection, prototype & mold
by YEUNG Hei, Marco, ARCH 7182 'Material Diaries', 2020*

STUDENT-LED MATERIALS RESEARCH & TESTING

Critiques on architectural and design education state that curricula were gradually transformed through the inclusion of scientific content, losing part of their traditional hands-on educational methods.[4] One hundred years ago, materials education at the Bauhaus, particularly in Johannes Itten's 'basic course' was focused on visual and tactile descriptions of material properties. The prevalent understanding of materials at the time questioned the value of hand-crafted work versus industrial precision. The aim of materials education at the Bauhaus was to reveal techniques and production processes that lead to the development of prototypes with new applications for production.[5] Today, we once more have to question our understanding of materials. Not only are we talking about composite materials, smart materials and nano-materials,[6] but we also must understand material dependencies on

land and people.[7] So beyond considerations of 'crafting', questions on material sustainability got likewise into the focus, asking what to reflect when classifying and specifying materials.

In the currently taught 2021 cohort, the brief for the 'Material Diaries' exercise was once more adapted and opened up to allow students to define their own working guidelines. It aimed to cover a wider range of research possibilities on a specific material which could include topics like embodied energy, CO_2 footprint or collateral pollution. The brief is open-ended for the prerequisite material research as well as the setup for experiments itself. (Figure 5)
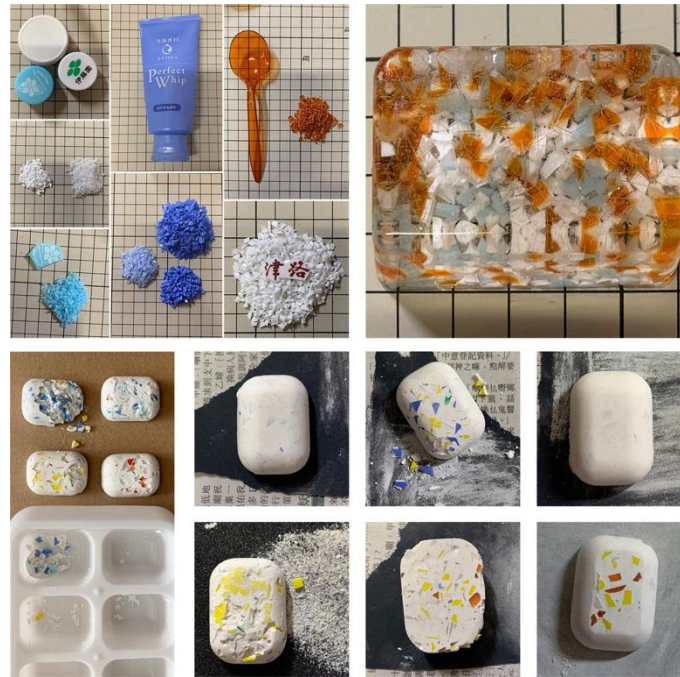
Figure 5. Plastic terrazzo DIY material experiments with recycled PET and HDPE
by LAU Fong Yui Yvonne, ARCH 7182 'Material Diaries', 2021

Meanwhile, the course is taught in hybrid mode. General brief introductions and lectures are still online, but small group meetings can be offered in studio, the workshop facilities or outdoors. Online tutorials to introduce material testing and tools as well guidelines for a voluntary 'Home Fablab' were provided to the students. This time, the introductions could be complemented with short workshops at the university's facilities.

As a result, students showed a wider range of materials, yet the focus shifted away from the iterative testing on DIY materials observed in the online version of the course. Students extended on desktop research, chose rather typical materials and focused on the availability of digital tools during this semi-distant learning.

After summarizing the learnings and challenges to run this and other courses in the materials & technology stream over three years with varying proportions of f2f and online teaching, two directions can be summarized:

1. Material testing influenced by trial and error should be accepted. The learnings structure in this course must be situated between exploratory and scientific; suggesting students to work with 'semi-structured experiments.'

2. Outcomes on material testing must be self-evaluated by the students. This should be structured by teachers to facilitate opportunities for vertical leaning between cohorts.

EVALUATION: A MATERIALS PEDAGOGY

The aim for a vital materials pedagogy is to facilitate students with a greater understanding of material knowledge and its application including concepts of sustainability, fabrication and construction practices.

In recent years, a variety of teaching and research tools working with materials were developed in design related disciplines. But for Landscape Architecture purposes, many existing resources – online databases and physical libraries – fall short. Many available databases are geared primarily toward architectural material usage and are stocked with materials more readily available in North American or Europe.[8] Their classification systems consider a variety of taxonomies but leave out important factors for landscape architecture. Many concentrate on typical properties like material category, form or sensory attributes, while other examples are considering subjective materials evaluations (Expressive-Sensorial Atlas)[9] or are connected to makerspaces (Institute of Making, Bartlett).[10] Students at the University of Hong Kong may access parts of the available information but cannot gain the benefit of actively engaging with the resource, for instance through manipulating the database.

Resulting from the analysis of these shortcomings and along with the ongoing effort to shape the materials stream of the landscape curriculum, I developed together with my colleague Ivan Valin a framework for a new landscape specific materials archive called TAL-L. (Figure 6)
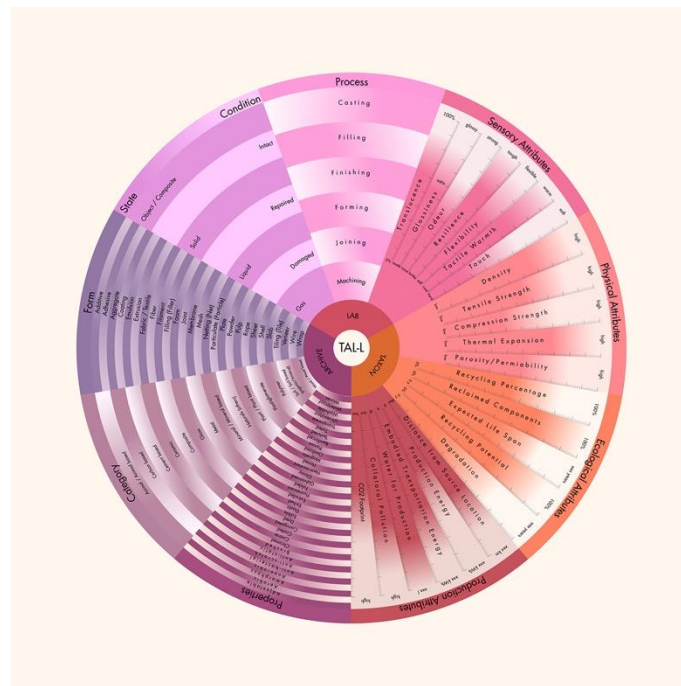
Figure 6. TAL-L Materials Library Classification Taxonomy
(courtesy of the author, 2021)

T – A – L describe the three facets of the library: Taxon, Archive, and Lab. Each of these three facets is both a reference and – through their design and organization – a multi-year learning opportunity.

'Taxon' describes the landscape specific organization based on a material's origin, ecological properties, production, processes, durability, and sustainability. These categories provide a conceptual scaffold for students to understand and design with materials in a systematic way.

'Archive' describes the collection of physical and digitized material samples, including found and manipulated materials and their variations. Data includes textual, visual, and graphic representations of the material, as well as information on its properties and performances, form, and procurement.

The 'Lab' is the experimental arm of the database and will encourage material experimentation as a basis for systematic environmental design and facilitate testing and other forms of analysis on manipulated materials. This component is particularly important for the landscape media seminar. It will allow students to understand and follow experiments and testing of earlier cohorts. (Figure 7) They can comment, edit, and manipulate earlier entries. It is the function of the 'Lab' to synthesize methods for working with materials and create opportunities for students to reach out to other university research laboratories as well as seeking collaborations with local practice.

Part science, part system, and part making, this library aims to develop new techniques for working with materials in landscape education and capture newly emerging technologies for regional materials.[11]

Figure 7. Documentation of loofah concrete experimentation
by TSANG Ka Lai Lilian, ARCH 7182 'Material Diaries', 2020

PROJECTIONS: VIRTUAL POTENTIALS FOR A DIGITAL MATERIALS ARCHIVE

As we have learned in 2020, pedagogies depending on hands-on and experiential learning should be designed to incorporate online modes of teaching and learning and be flexible to multiple modes of access. TAL-L emphasizes the setup as a digital platform – partially as a response to a continued focus on online teaching, and partially a recognition that student design and research workflows rely heavily on digital modelling and simulation, a trend that has only increased over the past year.

Meanwhile, educators around the globe have responded to teaching modes during this pandemic and are predicting how learning will be transformed afterwards. The opportunities in this forced worldwide shift to teaching online are evident and widely discussed. But likewise, the critique on this mostly reactive teaching mode should be heard and considered. Particularly in design related fields, teachers recall the values of face-to-face practical instruction and the physical output of design work. Critical voices ask if this "sensory deprivation of online teaching will be the new normal" and call for strategies to shape and deploy all the new technologies and platforms.[12]

Shaping TAL-L, we clearly acknowledge the shortcomings of online education and the absence of practical instruction but emphasize on the opportunities of an online resources as relevant and robust tool in materials education. In a time when all forms of teaching and access to resources are being reconsidered, we recognize the value of flexible teaching resorts ready to provide effective opportunities for blended learning. The core idea of this yet to be implemented database is structured

around engaging students with the resource – physically and virtually. The digital archive of TAL-L emphasizes on following key components:

1. Student experiments can be documented, tracked and evaluated.

2. Material experiments and their individual components can be searched through a variety of filters.

3. The database allows students to directly manipulate entries of previously tested specimen and propose to develop them further.

CONCLUSION

TAL-L will be incorporated in a range of courses, which can benefit from the database as a learning resource. For the Landscape Media Seminar as a core course in the PDLA program, I can summarize following learnings and future prospects:

1. Practical instruction is crucial to provide learners with basic information before starting the testing on materials. While lectures showed to be less efficient, the study of existing samples helps to start student's own material tests on an informed level. This justifies the importance of documenting experimentation and testing with students across cohorts.

2. Remote access to a variety of materials and previously undertaken tests is important. This is particularly true for DIY materials which often need various iterations and references before being developed into functional samples.

The landscape media seminar is commonly the first course to introduce materials as the program intakes students from non-design related disciplines. It is hoped that learnings from this course enable students to extend research-based learning and material experimentation, material performance simulation, and other forms of 1:1 prototyping. In future, we aim to provide students with opportunities to interact with professional practitioners or material engineers through the research, maintenance, and experimentation in the TAL-L Material Library.

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GRADUATING DURING A PANDEMIC: WHAT'S NEXT?

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INTRODUCTION

Digital technologies are changing different economic areas. The 2016 World Economic Forum, in Davos, named this era as "The Fourth Industrial Revolution", considering the impacts on all sectors. Virtual reality, Augmented Reality, Internet of Things are examples of digital tools that can enhance the quality of the design and construction process and attendance to the user's requirements, significantly changing the process of architectural and urban design.

At the same time, connectivity is an important aspect of this evolutionary process, allowing collaboration among professionals from different cities or countries. The future of design teams includes architects, engineers and other specialists from different parts of the world, working collaboratively through cloud-based video-conferencing services, such as the Zoom platform.

But the 2020 pandemic brought a new reality, as all schools and Faculties were closed due to COVID19, and all academic activities were "pushed" to the digital world. Fortunately, through the effort of professors and digital technologies consultants, undergraduate courses were rapidly adapted to the "new normal" and academic activities have continued – including final project presentations and graduation ceremonies. It is necessary, however, to evaluate how students have faced the challenge.

This paper presents the results of a survey conducted among graduating students of two architecture programs in order to identify their perception of the use of the web-based conferencing platform for developing and presenting their final project.

CONTEXT

The risk of a pandemic was known months before the COVID 19 outbreak. According to Schmitt[1] the world was not prepared to respond to a significant pandemic threat. The author highlights that since 2011 the world has seen nearly 200 epidemic events per year, and the cost of a pandemic – besides all human losses – can reach 0.7% of global GDP average – or US $570 billion.

According to a World Economic Forum Report[2], the future of jobs indicates that automation, in tandem with the COVID-19 recession, is creating a 'double-disruption' scenario for workers as technological adoption by companies will transform tasks, jobs and required skillsets. The survey indicates that 43% of businesses are set to reduce their workforce due to technology integration, 41% plan to expand their use of contractors for task-specialized work, and 34% plan to expand their workforce due to technology integration.

Fey et al.[3] documented the first problems identified through remote experience, and highlighted problems associated with students living and studying remotely, such as: no access to typical teaching laboratories, limited instrumentation and software access; great variation in housing stability and workspace; unreliable internet access; and added home responsibilities that take time away from academic activities.

On the other hand, some authors consider this an opportune moment to rethink higher education models. Gallagher and Palmer[4] believe that this period is likely to be remembered as a critical turning point between the "before time", based on analog on-campus learning, to the "after time", when digital, online, career-focused learning will become the fulcrum of competition between institutions.

Social relations also changed radically through digital platforms. Pike et al.[5] have the perception of a lingering melancholic mood with Zoom, as it relies on a simulation of the old world (in which we all could meet in person). According to the authors, the crisp lines of the boxes give each image/participant a hard boundary and a sense of limit that cannot be negotiated, whose limits can never be softened, altered or breached by participants.

These aspects must be considered in rethinking remote learning practices, particularly in light of the tendency to adopt web-based conferencing platforms even after the pandemic (e.g. webinars, livestreams). In this sense, it is important to identify what our students have to say about the "new normal" to ease and enhance the experience as much as possible for both – academics and students

CASE STUDY 1

On March 11, the WHO declared the novel coronavirus (COVID-19) outbreak a global pandemic, and on March 13 the Federal Government of the U.S. declared a national emergency. Mass testing started and the number of infected cases increased rapidly. The spread of COVID-19 did not occur uniformly throughout the US. The discrepancy among different geographic areas of the US across states, and even among and within cities was significant, as presented on Figure 1. There were also large differences in testing, infection rates and mortality across different socio-demographic population characteristics.
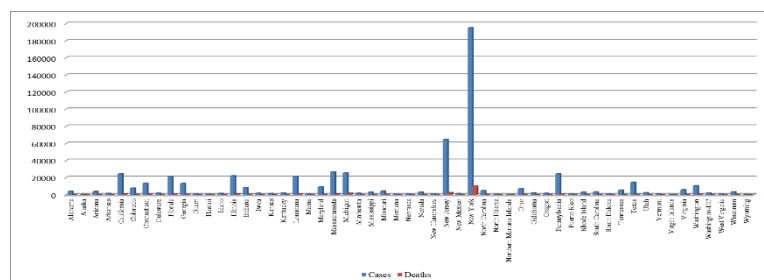
Figure 1. Coronavirus in the US - April 13rd, 2020[6]

Starting on March 22 Governor declared New York on PAUSE[7] , and established an array of restrictions publicized by television, newspapers, websites, blogs, and social media (Facebook, Instagram, Twitter). By April 2020, New York City was the most affected city in all of New York State (and all of the US).

The government also created a direct line to receive updates related to COVID through SMS[8]. During the first peak of the pandemic in New York City (from March 12 to April 29) 133 messages had been sent. These messages were analyzed[9] and eight categories were identified: [1] medical and COVID19 information (with updates on numbers and recommendations to avoid the spread); [2] remote learning

and school information; [3] food distribution; [4] price gouging control; [5] small business support; [6] motivational messages; [7] support for victims of domestic violence; and [8] general information. Figure 2 illustrates the frequency and type of SMS during the first wave (and worst period) of the COVID 19 pandemic in New York City.
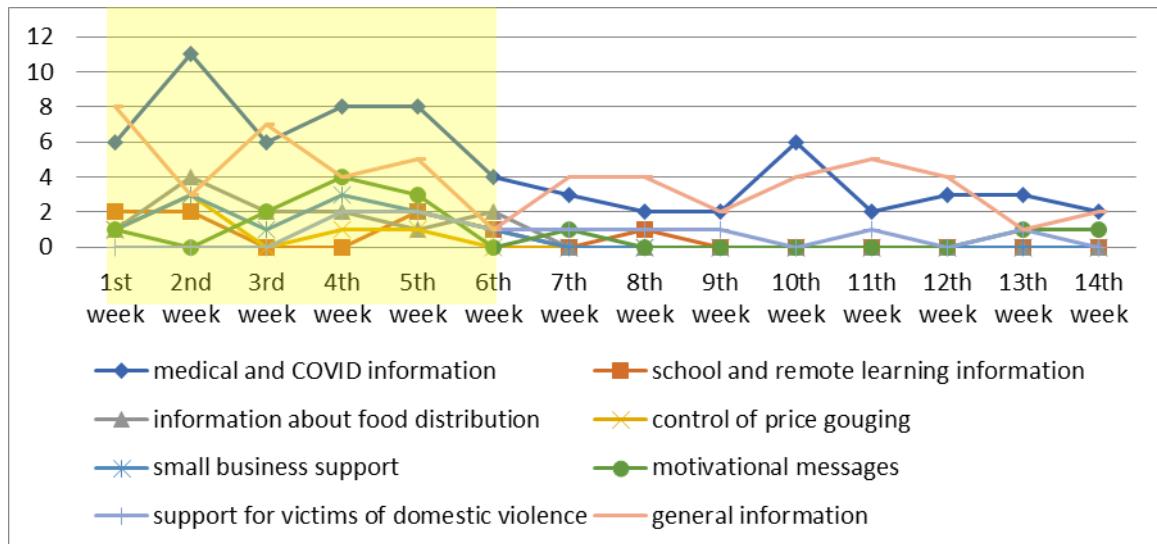
Figure 2. SMS March to June (first wave) – highlighting the worst period (March 12 to April 29)

With respect to school information, messages indicate the rapid transition to remote learning as presented in Figure 3:

Figure 3. SMS from March 12 to April 29 - remote learning

The need to migrate all learning processes through digital platforms brought professors and students instantly face-to-face with these new technologies Aiming to understand students' perception about the use of the Zoom platform to present their graduation projects, a survey has been conducted among undergraduate architecture students at Parsons School of Design in New York. The first group of undergraduate students in architecture who had the challenge of presenting their final projects through the zoom platform received the survey. Their opinions brought us some important insights about the experience. When asked about the experience of presenting the capstone design project through the Zoom Platform, 60% of respondents considered it a good experience, as shown in Figure 4.
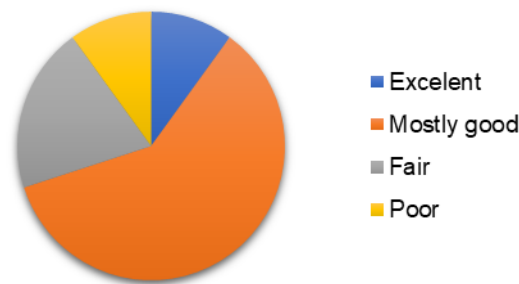
Figure 4. Case study 1 – students' perception on the Zoom Platform

Students were also asked to list the pros and cons of using the ZOOM Platform for their presentations. They identified several cons related to: technical difficulties; fragile interaction among participants; and difficulties in presenting an architecture/urbanism project properly. The speed of the internet was identified as a problem for interfering with the quality of interactions; on the other hand, some students felt less nervous when presenting their projects remotely.

Students were also invited to share closing comments. Few ideas have been added to the previous remarks, but one student said that it should be mandatory to turn on the camera during a zoom interaction:

"There is nothing worse than talking to a black square with a name on it."

CASE STUDY 2

The first case of coronavirus reported in Brazil occurred on February 25: a man traveling from Italy to São Paulo. As of March 31, there were a total of 252 cases recorded across the country. Campus shutdowns led to a quick rush to "remote learning" but the "speed" of the migration depended on different situations.

Brazilian public universities had to deal with a large number of students who did not have a computer or internet access at home. Thus, the migration to remote learning was slow, as the university must ensure that no students are left behind. For this reason, the conclusion of the academic semester was extended, and students in the Architecture undergraduate course of public Universities faced the challenge of presenting their graduation projects in October/November, instead of in July. Thus, they had more time to get used to the web-based conferencing platform throughout the semester than the Parsons students.

The survey was carried out with architecture undergraduate students at the Federal University of Rio de Janeiro to understand their perception about the use of the web-based conferencing platform to present their undergraduate projects. When asked about the experience, a total of 55.6% considered it as a good experience and none considered it "poor", as presented on Figure 5.

When asked about the pros and cons of using the web-based conferencing platform to present their final projects, opinions were largely similar to the answers presented by Parsons students, but some perceptions diverged.

One aspect highlighted by Brazilian students that was not mentioned by Parsons students is related to the possibility of having academics/professionals from different parts of the country (and the world) participating in the review panel. Another noted aspect was the opportunity to explore other digital alternatives to present ideas (e. g. videos, gifs, virtual reality, etc).
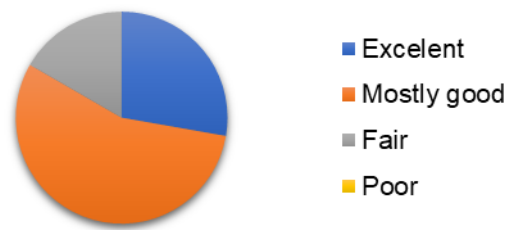
Figure 5. Case study 2 – students' perception on the Zoom Platform

Personal considerations also emerged as an important issue to address. Some students faced difficulties presenting the totality of their urban intervention proposition through a small monitor. Brazilian students were also encouraged to provide additional comments about the experience. Some testimonies revealed that this group of students was more familiar with the web-based conferencing platform than US students, since they were using it long before the presentation date of the final projects:

"Even before the Faculty publicizes the academic calendar, I was already meeting with colleagues and advisers (remotely) for orientation, to 'keep my work on track' even during the pandemic."

ANALYSIS

Before presenting our analysis of the surveys, it is important to remember the time interval between them. New York students responded to the survey at the beginning of the pandemic, in late May 2020. Brazilian students (Rio de Janeiro) had more time to get used to the platform, and responded to the survey at the end of November 2020.

Both surveys revealed a concern about internet access and speed. Considering the large number of images necessary to present architectural projects, a compatible system is necessary to adequately transmit students' presentations, without interruptions or other technical problems. Table 1 summarizes some answers related to this aspect.

PROS	CONS
- No ink/paper waste, thinking and showing the presentation. - Being able to share screen and annotate on screen. - More flexibility! More opportunity to use digital platform, especially when it comes to design tools. - I presented a film as a synthesis of a theoretical work; therefore, due the format chosen, I did not suffer any major losses. - The use of other means of representation ended up making more sense, as opposed to certain classic methods (printed material being substituted by gifs, videos, etc. - Time optimization in general.	- Some students would get cut off because of their internet access, which wasn't very good while they were presenting, so they'd have to start over. - Not being able to see all the drawings at once, having to flip through a drawing (or specific drawing), zooming in/out to see bigger or as a whole. - Not being able to present a physical model or even make one without the facilities. - Greater concern on project scale visibility, considering the computer screen limitations. - Lack of broader knowledge about the videoconferencing tool. - Difficulty to work in the urban scale through online presentation

Table 1. Students' perception using the Zoom platform – technical aspects

Some personal opinions revealed the pros and cons of social distancing and remote presentation, as shown in Table 2.

PROS	CONS
- Since I was presenting at home, I wasn't as nervous as I would be if I was presenting in front of a group of people. - Presenting through a slideshow instead of the walls allowed me to know exactly what people will be seeing, and when! They were not able to wander their eyes around. - Remote contact with classmates without the need of long trips. - Possibility to invite and have members of the audience and spectators from different parts of the country and the world. - It is easier to present remotely than in person!	- Zoom misses the opportunity to engage in debates that will only happen in person. - Presenting to audience at their homes also leads to a lot of distractions and less "*presentness*". - The critique was less interactive now as the critics couldn't play around with our models and all… - No sense of community and support from my cohort and the critics. - It was a little harmful not to have face-to-face meetings and exchanges through printed materials. - Impossibility of using the physical space to propose a sensitive experience in addition to the traditional slideshow. - Difficulties to develop my project and receive orientation remotely.

Table 2. Students' perception using the Zoom platform – personal aspects

There are many positive aspects using digital technologies in the learning process. Therefore, it is worth discussing how to incorporate these alternatives into the daily lives of schools. As highlighted by Green *et al.* [10], learning experiences that emphasize online participation will always be different from what one experiences in face-to-face learning at university spaces, but the quality of these interactions is not necessarily inferior.

CONCLUSION

The use of digital platforms for remote learning is not new, but COVID19 made it mandatory, as social distancing is one of the most important measures to stop the spread of the virus. But most academics/instructors were not familiar with digital tools and methods and have had to learn very rapidly without adequate opportunity to exchange information among their colleagues.

On the other hand, students had not been prepared to use a web-based video conferencing tool to present their final projects, and resented the fact that they could not share ideas in the ways for which they have been trained throughout their architectural education.

Even considering that the general evaluation of the experience with both groups – New York and Rio de Janeiro – has been perceived as "mostly good", many students did not mention any pros of the experience, and all students listed one or several cons, signaling that, for these groups, in fact the experience wasn't 'mostly' good.

There are many aspects to be considered if universities wish to adopt a hybrid format for academic activities, particularly the necessity of proper internet access. The use of digital media to properly present design proposals and the dissemination of other means of communication (using videos, gifs, and other possibilities) are positive features of the digital format.

The opportunity to invite colleagues and professors from different parts of the country (and the world) to attend student reviews is a positive element highlighted among Brazilian students. In this sense, the use of a web-based videoconferencing platform can democratize the sharing of information, giving all students more visibility for their final presentations. This alternative can also be considered for the orientation process; with different teachers sharing ideas and guidance through collaborative online events (live).

Other benefits of remote learning include: the possibility to connect from anywhere (depending on appropriate internet); the possibility to record classes ensuring total access for all students (even those who were unable to attend the class session); the possibility to maintain classes even under challenging scenarios (lateness or absence due to metro breakdowns, blizzards, floods). In addition, it is necessary to improve "remote learning personal skills" through web-based platforms, so students can feel embraced by classmates and professors, and can achieve a sense of community, even during remote learning activities.

It is not yet clear how long we will face the restrictions related to COVID19 and, even considering a "planetary cure", the permanence of web-based videoconferencing platforms in our lives is a strong possibility. In addition, it is possible to infer that all teaching and learning processes, as well as jobs and most forms of work, will be strongly affected by the digital technology revolution. The pandemic gave us important clues about what should be presented to our students, in addition to the contents strictly related to architecture and urbanism. Future professionals must know how to properly communicate their ideas remotely, and this type of social interaction must be explored during undergraduate classes.

Digital technologies can improve this remote interaction, offering alternatives that have barely been explored – e. g. the immersive experience inside architecture relevant buildings through virtual reality, or the detailed information of each component, through augmented reality. Among all the possibilities, Building Information Modeling seems to be the most important, as it can integrate other digital resources through the virtual construction of the building.

Thus, we can conclude that the pandemic consequences brought new possibilities to remote learning and remote working, and future professionals should be prepared to master these new alternatives, sharing ideas through web-based conferencing platforms. Even after the pandemic, with the gradual return to our in-person classes, it is important to consider some distance activities so that we don't forget what we've learned during the pandemic. We must be prepared.

ACKNOWLEDGMENTS

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SCREEN AND PENCIL, AN INTERTWINED COMBINATION FOR TEACHING: FIRST REFLECTIONS ON THE IMPLEMENTATION OF AN ONLINE TEACHING TOOL WITH SPECIALISED VIDEO-TUTORIALS (SKETCH ATLAS) ON THE TOPIC OF FREEHAND ARCHITECTURAL DRAWING

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INTRODUCTION
Play, pause and replay

There is a compendium of extensive literature on approaches within the twentieth-first century educational system and the everlasting introduction of new systems. The combination of learning specific skills but also the unlearning of systems in the educational context can be found in the vision of Teresa J. Franklin.[1] Important components in the contemporary blended environment in Franklin's analysis are the mobile aspect and the need of direct connection through the cloud, MOOC's for everyone and virtual learning. In this regard, she argues that teachers constantly have to prepare students for unknown new environments in their learning trajectory and adept their system to it. The system for learning has to be flexible and with the new internet-mobility the classroom is open far behind the own university. A system of play, pause and replay is often a basic ingredient.

In the field of architecture and especially by the start in the first year for fresh students, there is an important skill to be learned. This skill is intrinsically connected with the profession: drawing and more specific the freehand architectural drawing. This type of drawing or sketch is basically made with a pencil on paper without any other device and learned in a studio environment, the "drawing room". How can this basic skill benefit from the omnipresent interconnectivity of the new learning systems? Is it possible to connect in a controlled way the online aspect with the tangible blackboard full of charcoal sketches and more important, the pedagogical system behind it? And more over, what can be the extra value of this implementation?
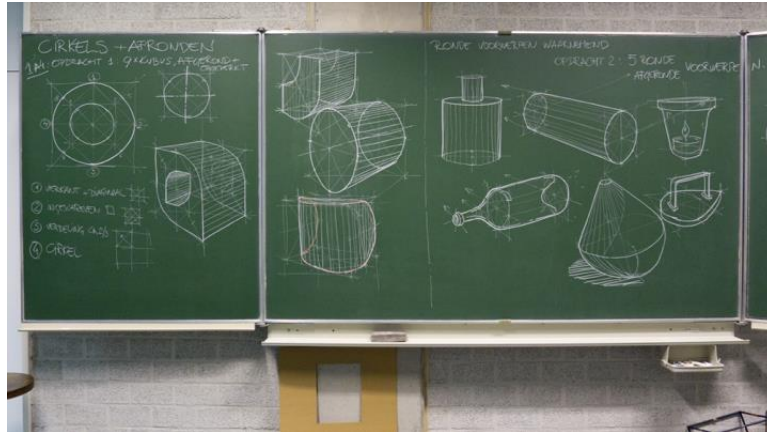
Figure 1. Blackboard with charcoal drawings, course with topic of curved forms, photo Iwert Bernakiewicz.

Figure 2. Classroom with blackboard, sketch course freehand architectural drawing, photo Iwert Bernakiewicz.

In 2018 we started with an innovative educational project (IOP) at the Faculty of Architecture and arts of Hasselt University. This project was enrolled under the name Sketchatlas (SA).[2]

The SA project aims to install the systematic digital registration by means of video recording of the zooming in on manual sketching skills, actions and processes within the course unit sketching of the study program (interior) architecture. The final goals were the immediate and delayed pedagogically active didactic unlocking (teacher tutorials via video clips in a blended learning process), the focused operational use of didactic feedback instrument and the durable preservation of the curriculum (archive).

The unlocking of these learning processes and educational content by means of video tutorials related to sketching takes place via a digital platform[3]. The SA, version 2.0, includes several unique features at this moment: eight and a half hours of tutorials in full high definition (4K) with a complete pedagogical trajectory and systematically structured. In the exhaustive study by Koenig and Schneider on the topic of online teaching the technical (dis)advantages of several open learning platforms are examined. They conlude that a customised website is the best starting point for a complete on-line video course. [4]
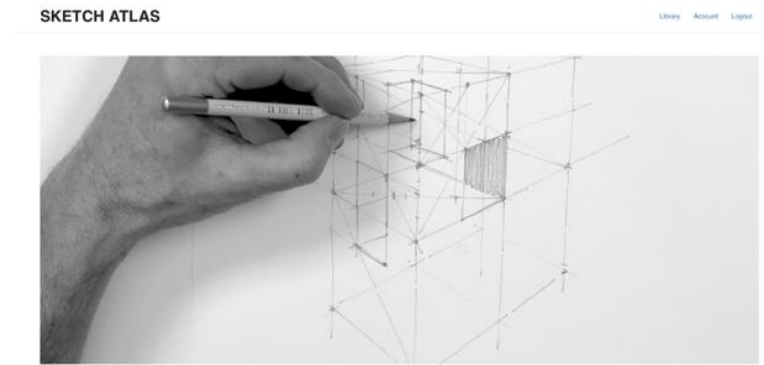
Figure 3. Still of tutorial, freehand architectural drawing of cubes, photo author.

Atlas

The term Atlas in our project deliberately refers to the structured compilation (from general to specific) of information and a general search function.[5] The tradition of working with an Atlas and implementing the systematical order as a core concept is not new, we refer to the historical analysis of Urich Keller on this concept.[6] A further step is that the concept of an atlas in the context of teaching becomes a handbook with a complete pedagogical structure. Hubert Lochner states that the narrative of a handbook is a key-element of the discourse in teaching through history.[7]
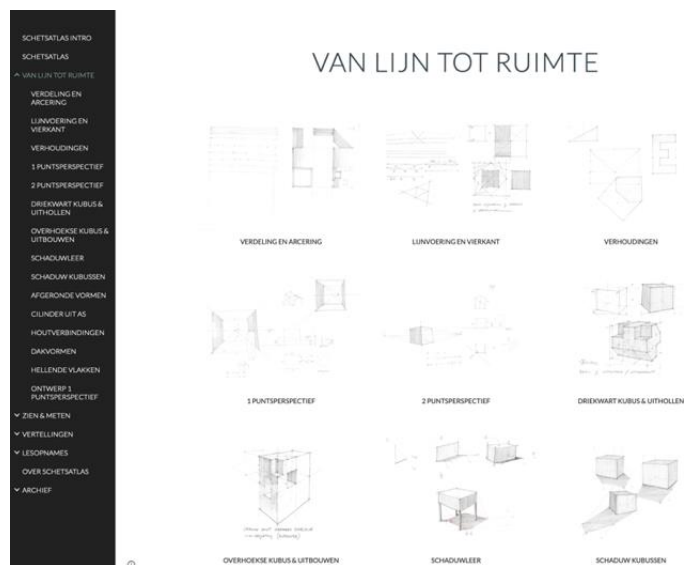
Figure 4. Still of matrix of SA version 1.0, chapters and thumbnails of tutorials, each figure is a tutorial, photo author.

historical roots

In addition to a live-demonstration, the use of step-by-step sketch examples is a proved didactic tool. Looking at example books with systematically worked out cases, in the tradition of the Beaux Arts architecture schools, is a tested method. However, a systematic sample book of drawing via elaborate sub-sections and descriptive information has become a pedagogically underexposed method in contemporary architectural education. This historical learning tradition in schools of architecture must be rapidly embedded in the contemporary context without loosing the quality. The contemporary context necessarily includes a digital and international component.

Contemporary approach on sketch education

If we zoom in on the sketching method, what method of sketching is taught within the programs? On the one hand, the understanding of a piece of furniture, a space or an urban environment is done through sketching: the so-called observational sketching. Learning to draw methodically (building up step by step) from perspective and recording it on paper provides insightful information about size, proportion and rhythm. This **observational sketching** is a basic skill that is taught step by step.

In addition to this observational learning process, the training teaches how to construct a design while sketching.

Figure 5. Still of tutorial, observation sketch and the narrative of the sketchbook, photo author

Discussing and sharpening a design is done through the permanent production of design sketches: **sketching by design**. Both the observation through sketching and the final design through this same medium (alternating and sometimes overlapping) are forms of knowledge transfer. This specific transfer of knowledge has essentially two dimensions.

Sketching helps the designer to design and structures the internal thought process through intermediate steps. It is a method to analyze a complex problem and to formulate a personal answer through the design research. This is the internal dimension.

However there is also the external dimension: sketching serves as a mean of presentation or consultation during the guidance and the jury moments with the teacher in design education but certainly also in the professional world. For the (interior) architect, this presentation via sketches is an essential element of communication with himself, the office, the client and the executor.

Status Quaestionis

In the curriculum of Hasselt University, time is set aside to learn manual drawing skills. There is a long tradition of manual drawing and it still has its own place next to the more recent skills of computer drawing. In comparison to other architecture faculties, it is striking that a separate course is still set aside for the mastery of manual drawing skills. It can be argued that at other faculties, sketching often merges into a more broadly oriented course unit. In this case the mixing with other disciplines (computer drawing and presentation drawing) leads to an erosion: the previously explained strategy of perceiving and communicating, the important basic pedagogical component with respect to sketching, completely disappears. There is (too) much attention paid to mere representation, as a result of which the important methodological sub-aspects of construction, structure and perspective receives less systematic attention. It is precisely by being able to understand and represent objects and space in a structured way that spatial insight is developed and strengthened.

Internationally, one can see a twofold movement: holding on to a tradition or completely rethinking (and partly losing) the built-up tradition of sketching. We will further argue that in our opinion there is a well-founded argument to take the optimal path and implement pedagogical innovation through digital media (video) and combine it with traditional methodological tools - such as manual sketching. What are the important pillars in this teaching project of sketching? The answer to this question can be structured into a number of successive sub-components, namely: methodology and pedagogy of sketching. We will show that these points can be refreshed within the project.

methodology

The process of creating the sketch as a tool for registering and designing has, as explained earlier, simultaneously communicative and design-forming qualities. Interior designers and architects have developed a drawing language in which the research on and conception of qualities within a space are done through sketching, namely: the structure and construction of the project or object, perspective, colour and depth perception.

pedagogy

The transfer of knowledge of these aspects of architecture is done on the one hand by watching the act of drawing during the creative process and on the other hand by the mimesis and the execution itself. The teacher's demonstration in the sketching studio is a fundamental step in learning process.

The aspect of methodology has been documented many times in literature, we used the work by Frank Ching as a starting point.[8] The correct construction of a perspective or the correct framing of an image are topics that are widely known.

The second component however, the pedagogical transfer of looking at the action of sketching is less systematically developed. Nevertheless demonstration is always mentioned as being very important. The act of sketching often has an aura of a forgotten craft, a skill to be learned or a unique talent.

This last association is due to the fact that in addition to a permanent transfer of knowledge, there is also a link with the artistic component in the training of (interior) architecture.

Drawing is a language that automatically contains various registers, from design search to constructive try-out. A personal signature forms a sharper part of the designer's identity. It should be clearly emphasized here that the mere cultivation of this personal signature was not a goal in itself within the SA project. As mentioned before, the main goal of the sketching course is to teach the basic skills of observational and design sketching.

As also stated earlier, throughout sketching there is a thinking process on the part of the designer: actions are performed one after the other on paper in a certain order. Lines and planes are placed next to and over each other and result in a final image with meaning. The action and handling of drawing therefore has a very volatile component: lines disappear and the end result does not (always) reveal the creative process. The pedagogical demonstration of sketching is therefore a continuous help in structuring a thought process. By showing the method in the tutorial the thought process is also formed. A good and relevant comparison is learning to read and write, where forms and conventions are also practiced in a similar way in an intensive learning process.

THE SKETCHATLAS IN THE CLASSROOM
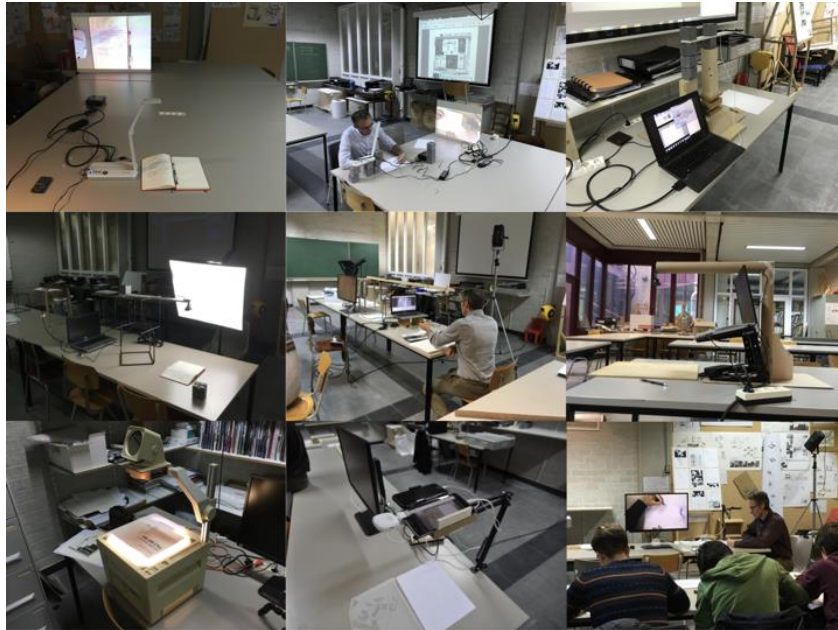
Figure 6. Testing of recording and projecting during sketch course, photos Aarnoud Derycker.

The pedagogy and methodology of the teaching process of freehand architectural drawing are intertwined. The following problem statements, to be read as challenges, were detected by the start of the SA project within the courses and are all linked to the pedagogy and methodology. These observations are also often not exclusively linked to one course unit or one program but are exemplary for learning processes where hand-on skills (universal term: "tacit knowledge") are passed on.

Too little time spent per student in demonstrating (1 on 1) sketching

Demonstrating and teaching sketching to each student or groups of students, however, often poses practical problems in architectural education. It is impossible to constantly make a sketch live for each student in a one-to-one class environment. The groups vary from 20 to 30 students per tutor with lecture periods of two hours each, which makes it virtually impossible to do a complete and thorough tutoring per student on all facets of the specific sketching exercise. Sketching on location (not in the sketching room but elsewhere) is impossible to organize in such a way that adjustments to the drawing can be picked up automatically by different students. With the SA the teacher can organize this process. The constant loop of a tutorial on the screen fulfills the act of repetition.

Impossibility of recalling specific (past) phases within the sketching process for Feedback

In addition, the action of sketching during the lesson moment or afterwards can never be recalled. In a learning process, repetition is always an important learning tool. When a drawing is set up in pencil and then finished off in ink, you inevitably lose the pencil phase. Sketching skills as previously argued must be learned systematically, repetition - also of mistakes and common mistakes - is very important in learning a skill. The videos of the SA can be frozen on every moment.

Absence of a quickly consultable archive of didactic teaching material (faculty level)

There was currently no well thought-out educational archive policy regarding the didactic teaching level. The process is not documented. Specific knowledge of the teachers that just cannot be compiled in papers or publications was lost. The SA is growing every year and more over with the search

function (version 2.0) it becomes also an archive. Good practice from outstanding students but also common mistakes of the average student, as mentioned before, can be archived efficiently through the SA into the education system in a structural way. The importance of "learning from mistakes is important in order to be able to start a future thorough self-study project freehand architectural drawing education.

Absence of a platform for knowledge exchange on hand sketching (on an inter-university and international level)

There was no workable tool for exchanging knowledge about the sketching process with other faculties of architecture in a national and international context. Exchange is thus forced to remain sporadic and coincidental in nature. However, an international context is important and indispensable for the proper accumulation of knowledge and, above all, the proper implementation of educational methods. In the 2.0 version the SA will be available for other schools of architecture.

What was the method and which actions were done in the timeframe of two years?

The first action for the SA project was: the recording of the tutorials, directing the recorded material and to classify the tutorials in a consultable matrix connected with the pedagogical system.
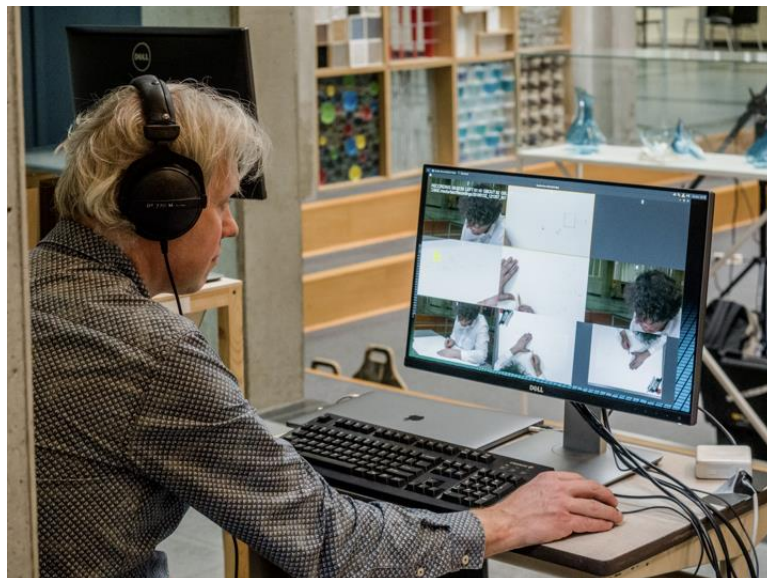
Figure 7. Recording day with multiple camera system bij EDM of sketch and hands of sketcher, photo Iwert Bernakiewicz.

Filtering and directing the material was strictly necessary. That is why in this project there was an important task for a "director", to systematically collect the material and to introduce a first classification in order to build up a systematic atlas. The profile of this person was therefore someone with a technical and directional profile and with an affinity for the subject (graphics in general and especially sketching). This person acts as a "flying reporter". Prepared lesson situations and specifically set up test moments (zoom in of hands sketching teachers) are systematically arranged by him or her in the atlas according to the current course model.
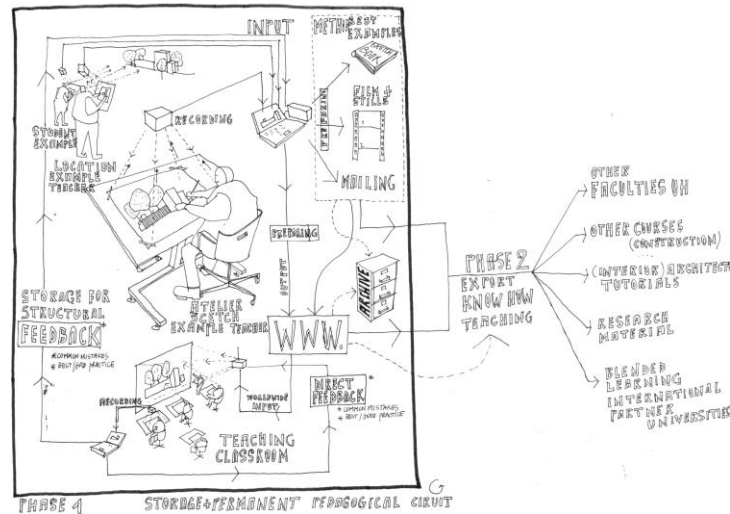
Figure 8. SA in the pedagogical system: classroom support, archive and learning from distance, sketch author.

As illustrated in Figure 8, the concept of the SA is a continuous loop. It includes both recording of sketching activities in the classroom environment and sketching by observation on the move. The sketch shows a multitude of possible (knowledge) circuits with moments that the video recording (of student and teacher work) can be actively used in the learning process. Feedback (literally rewinding the action) can happen on all those circuits. This is the big difference with the classical approach.

The approach within the teaching environment will change. Groups of students can work with the basic material and also include their own drawing process in the lesson. In this way, a comparison can be made and general learning conclusions drawn. The best examples and a systematic overview of basic exercises (the idea of the atlas) can be called up at any time. Both in the learning environment at the university and in one's own home environment/study.

CONCLUSION
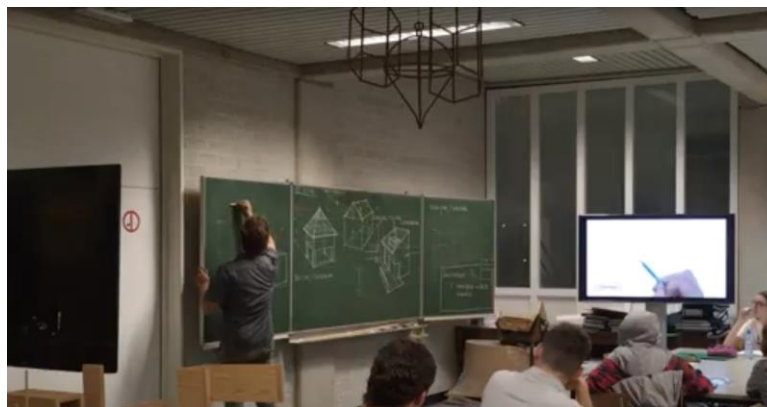
Figure 9. SA used in class: combination of blackboard and screen with loops of tutorials, photo Aarnoud Derycker.

The project SA punctuates a pertinent false opposition in an architectural-educational context: the manual versus the digital. As already mentioned, the objective was to apply a digital technique very precisely in the architectural-educational process. The opening up of teaching material from sketch

courses has never been done systematically in this way. The creation of a link to students now and in future generations via a digital access (video, website) is a new way of transferring knowledge from the courses in a durable way.

The innovative aspect of the project lies in the combination of various goals namely improvement of the educational process, the archiving for educational development and the testing of a new platform. Goals are combined on the level of education, knowledge transfer and archive thinking. The project is a recalibration of an educational transfer.

Lockdown testing

A second conclusion is that even in a stress-situation, the 1.0 version was intensely used during the lockdown of March 2020, the system proved to be adequate. Before this special period parts of the SA were used in a blended form, the combination of the teacher and the screen with the constant play of the SA in the classroom as you can see in Figure 9. The drawing room became at that moment a blended teaching environment.

In the 1.0 version, used during the lockdown with a content at that moment of 8,5hours tutorials, the feedback module was not incorporated. However, by using other software and cloud functions (google drive, Miro) the students were able to communicate with the teachers. A special section of home-tutorials was installed on the platform during the lockdown. The complete off-campus scenario was a hand-on approach where important lessons were learned. The uploading of student work (home work and tasks) is a very time consuming and the need to comment with a (digital) stroke on the students work stays important. This is one of the reasons to headline the development of a feedback module in the 2.0 version. The proof is in the testing.

Without a proper framework – in this case the idea of an organization of content like an Atlas - the transfer of a specific pedagogical process during a lockdown (how to learn to sketch as an architect ?) would be very difficult. Fabrication of digital teaching material of high quality is a starting point but an overview on content and concept of order must be the first step. In an open discussion with students before the lockdown the SA was appreciated for its added value. An important remark was that it was never seen as a complete replacement. The real blended effect of the SA is the combination. The SA is not a replacement of the drawing room but a compagnon with added value and extra possibilities.

NOTES

[1] Teresa Franklin, "Embracing the Future: Empowering the 21st Century Educator," *Procedia - Social and Behavioral Sciences* 176 (2015): 1089–96, accessed April 5, 2021, doi.org/10.1016/j.sbspro.2015.01.584.

[2] The project Sketchatlas (SA) at Hasselt University is not a project of one person but the continuous effort of a team. I want to thank my close colleagues for all their (ongoing) work on the project and the input for this paper: arch. Aarnoud Derycker (technical conceptualization/development SA + content specialist sketching), arch.Iwert Bernakiewicz (co-author of basic idea SA + content specialist sketching), dr. arch. Lieve Weytjens (business developer at Hasselt University) and Bea Cleeren (transfer process to market ,innovation and spin-offs at Hasselt University in the Tech Transfer Office). We worked together for the recordings with Professor Philip Bekaert of EDM (centrum of expertise on digital media at Hasselt University). A trailer of the project you can find here: https://www.youtube.com/watch?v=0p4xk-T7e0g

[3] The technical development of the platform (programming + back office) is not the subject of this paper. In the technical process of development the 2.0 version we choosed the wordpress platform with different plug-in options. More information on word-press you can find here: https://wordpress.org.

[4] Reinhard Koenig & Sven Schneider. "Evaluation of systems for video-based online teaching: Create your own MOOC or SPOC," proceedings *eCAADE37 /SIGraDi23 Challenges – Education and research – volume 1*, (2019): 110-116, accessed april 13, 2021 doi:10.5151/proceedings-ecaadesigradi2019_060.

[5] In the Encyclopedia Britannica, "Atlas" is described as one of the Titans in Greek mythology, son of the Titan Iapetus and the Oceanid Clymene (or Asia) and brother of Prometheus (creator of humankind). Atlas was one of the Titans who took part in their war against Zeus, for which as a punishment he was condemned to hold aloft the heavens. In many works of art he was represented as carrying the heavens (in Classical art from the 6th century BCE) or the celestial globe (in Hellenistic and Roman art). Gerardus Mercator (1512-1594), a Flemish cartographer, made a series of publications with the intention describe the creation of the world and its subsequent history with a dedication to Atlas. This *Atlas*—the term still used to indicate a collection of maps— became the term to describe a systematic collection of ideas and images. Accessed April 28, 2021. https://www.britannica.com/topic/Atlas-Greek-mythology   and   https://www.britannica.com/biography/Gerardus-Mercator.

[6] Ulrich Keller, "Visual Difference: Picture Atlases from Winckelmann to Warburg and the Rise of Art History," *Visual Resources* 17:2 (2001): 179-199, accessed april 12, 2021 doi: 10.1080/01973762.2001.9658588.

[7] Hubert Locher, "The Art Historical Survey: Narratives and Picture Compendia," *Visual Resources* 17:2 (2001): 165-178, accessed april 12, 2021 doi:10.1080/01973762.2001.9658587.

[8] Ching, Frank. *Drawing: A Creative Process.* New York: John Wiley & Sons, 1990.

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A NEW AGE OF LEARNING: ONLINE LEARNING AND THE STUDIO CRITIQUE

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INTRODUCTION

Experiences with emergency remote teaching in 2020 have motivated a broad re-examination of teaching and learning practices including, for studio education, that longstanding staple, the studio critique. Sudden changes to learning caused by the COVID-19 pandemic have accelerated our knowledge of online learning possibilities. Rapid experimentation has taken place and we have discovered new ways of working. We are now entering a more reflective, transitional phase, asking deeper questions about the future of delivery and looking to issues of course design including the integration of more flexible structures to guarantee the future of courses. This paper offers a contribution to the exploration of blended learning modes for studio education with a focus on the studio critique. The potential of online spaces for extending this signature pedagogy are discussed and ideas toward guiding principles for integrating online learning modes are offered.

Art and design education has always utilised the most progressive forms of pedagogy; active learning, collaborative models of inquiry and critical pedagogy.[1] Based on student-centered, experiential active learning[2] studio teaching principles and methods continue to be of great interest to leading educational practice and theory. Elements of studio education have been identified as developing the skills necessary for contemporary transdisciplinary researchers,[3] and studio education fits the model of 'a pedagogy of uncertainty' described as necessary for taking on the challenges of a contemporary, supercomplex world.[4] Continuing in this tradition the opportunity now presents itself more boldly than ever before for studio education to contribute in an exemplary way to the integration of online learning in traditionally face-to-face, social learning contexts. Examining online design studio pedagogies, researchers at the Open University (UK) have commented that "Social learning mechanisms represent one of the oldest and most natural pedagogies, and online studios, one of the newest forms of human interaction, offer novel opportunities in which such learning can take place."[5] What are these opportunities? How can they add value to studio courses? The following preceeds from these questions with a central pedagogy in mind – the studio critique.

Based in complex humanistic interactions, the studio critique initially presents as one of the least transferrable to an online setting. The disconnected, virtual space of the online environment appears to be no substitute for the in-person, real time experience of a traditional studio critique. There is a level of natural intimacy essential to the kind of discursive conversation that happens in a face-to-face critique that simply cannot develop online. The start of the 2020 academic year made this plainly

clear. At the same time, the pivot to online learning also exposed new opportunities many of us had not previously imagined and raised afresh critical questions of this enduing curriculum component and its future development.

EVOLUTION OF THE STUDIO CRITIQUE

Research has located a number of pedagogical difficulties as well as benefits with the traditional crit. Calls to evaluate its pedagogical value and to restructure its form have been forthcoming for some time.[6] Students frequently report on the anxiety, fear and nervousness experienced in the art/design critique. These negative emtions can contribute to an inability to learn from the feedback given.[7] It has been reported to be a predominantley teacher-centered method[8] with an uneven power asymmetery between staff and students.[9] While causing anxiety, the crit also remains a highly valued learning tool and a distinguishing factor of studio education which students appreciate.[10] McCarthy's empirical research on the Design Crit recommends introducing new crit types rather than replacing the Traditional Crit, which is valued stating: "Supplementing it with other crit types may increase student skills and so reduce anxiety levels".[11] Similarly, Smith (2011)[12] recommends that alternative methods are adapted alongside (if not in place) of the standard studio crit in response to the many negative issues with it reported by students.

As a consequence of our recent unanticipated plunge into online learning many of us now have a much stronger sense of how digital spaces can offer an alternative, viable crit type. Of course, e-learning technologies have been available for decades now and examples of fully online and blended configurations of art and design courses exist and have been successful. Pektas discusses the opportunities and challenges of the virtual design studio reporting that blending a traditional studio with online components enabled students to benefit from both methods.[13] With regard to the studio critique, research has been emerging that illustrates how technology has the potential to supplement in-studio experiences in ways that extend the pedagogy. Kulkarni, Bernstein and Kelmmer suggest techniques for augmenting the physical stuido critique with online self-assessment, comprising detailed weekly assignments, a set of rubrics students use to evaluate their work, an online submission process to encourage students to look at each others work, and an assessment system combining self-assessment and staff assessment.[14] As part of a blended learning approach in stuido education Bender and Vredevoogd demonstrate a project critique system where students submit design work online and audio critiques are created for the whole class to listen to.[15] Speech recognition software is used to provide a written text of the critique and files (images, audio etc.) are archived and accessible throughout the semester. This format maintains a permanent record of student work and participation. Ioannou describes an interesting outcome of setting up a blended learning system for a design studio course where, in the end, the students did the blending by choosing the degree of their involvement in the various online/offline components offered. In this example studio blending is conceptualized as being an "open set of resources and open modalities made available to students without prescribing the manner or extent of their use".[16]

The socially interactive characteristics of teaching and learning creative arts subjects have long stood as a reason in the mind of many educators why it may be difficult or even impossible to teach these subjects online.[17] But recent mass experimentation through necessity has prompted more serious interest, particularly in blended modes, moving us into a new stage of thinking and development. Blended learning is said to be on the cusp of transforming higher education, described as "the organic integration of thoughtfully selected and complementary face-to-face and online approaches".[18] An approach to the integration of online modes that considers how the affordances of digital systems may extend and expand the pedagogy of the critique feels close to the kind of thoughtful, 'organic

integration' studio education may be seeking. The following ideas for guiding principles when considering online critique components are based on my own reflections and analysis of emergency online teaching contextualised within wider research. These notes are offered in the spirit of continued research and debate and learning from each other.

IDEAS FOR GUIDING PRINCIPLES
Early stage formative events

Particular kinds of critique, related to particular phases of the creative process, may be more or less suited to online events. Early stage, formative critiques, for example, (sometimes called interim or process crits) are characterised by collaborative problem-finding, conceptualising potential directions and alternative actions. They occur during the evolution of a project and focus on formative, developmental feedback. Later stage review events (the 'final crit') tend to focus on evaluation and refinement and are often summative assessment events. Writing about the online crit, Barber has suggested that idea generation, where spontaneous, fast-paced, dynamic discussion takes place, is best suited to face-to-face teaching but that subsequent concept development could be suited to an online environment where ideas require some percolating and reflective consideration.[19]

The way a critique session is structured and facilitated will help focus the it in a direction that is appropriate to its particular purpose. The early-stage critique, for example, is usually more conceptual rather than visual, with the structure of critical dialogue quite different to later stage, evaluative sessions. It's open, diverse, speculative and informal nature may benefit from the flexible, intermodal shape of online formats. In Marshalsey and Sclater's study of the successes and challenges of moving studio online students noted that online classes felt more informal than formal as a social encounter and "saw their educators as peers as the hierarchy between educator and learner became less visible".[20] This informality and breaking down of power relations may add to the success of the early stage online critique.

Preparing quality documentation

In our online studio classroom, we quickly learnt how critical it was to prepare good quality documentation of art/design work-in-progress to share on-screen. The considered use of photography, screen-capture, video, audio recordings, drawing etc. to represent work is an important part of the online critique experience. Good quality documentation, carefully designed to show work to best advantage made the process of explaining and conveying ideas and providing feedback more efficient and effective. The development of skills in documenting work for screen presentation and critiquing digital images of art/design work in an online environment is valuable new learning for the reality of future work and practice. In the art world, for example, artwork is often first judged digitally: as images on social media or artists' websites. Digital literacies, including communication skills in professional digital spaces are also skills graduates will need in the art/design working world.

Intermodal communications

Online communications, with their intermodal combination of visual, verbal, and written communication, have the potential to extend the way ideas are circulated during a critique and the way feedback is received by students. Masdéu and Josep, writing about distance and blended learning in the context of architectural education, note that different modes of communication offered by blended learning offer learners the possibility of extended online discussions, complementing the activities in the physical studio.[21] Comment posting and chat facilities (both synchronous and asynchronous forms) offer the additional opportunity for constructing critical comments through a

variety of means. As part of the live online critique format, for example, students and staff can utlitise text-based systems for delayed observations and reflections in addition to more 'instant' verbal commentary. Receiving feedback from tutors and peers in a variety of formats, archived so that it can be returned to, is helpful for many students. The obvious benefit of recording live online sessions offers students another way to access critique content.

The online crit also has the potential to offer a more even space for dialogue through the affordances of intermodal communications. Stuart-Murray observes a common situation in the physical studio critique where "tutors often sat at the front of the class, so eye contact was only made with the student presenting. In this situation the student presented to the tutors, not the class. Thus the majority of interactions occurred between tutors and the student presenting".[22] The online crit does not encounter these same spatial issues with its altogether different presentation of 'the room' as a flatter, potentially more equal space. The work itself is often the centre of attention and many of the negative and possibly debilitating emotions experienced by students in the physical studio event are reduced, helped by options such as turning one's camera off. The alternative structure and modes of communication extend different opportunities for working actively and collaboratively, arguably encouraging interactions between more staff and students. The opportunity to participate equally in class has been recognised as an advantage of online learning.[23] New research by social psychology on the self-focused attention triggered by the self-view in video conferencing explains the sense of heightened awareness of how one comes across in online conversation[24] and this may have an effect on behaviour in these settings. Perhaps this increased access to self makes tutors more conscious of themselves as potentially disproportionate participants in a critique? This may effect a change in the way they operate, potentially supporting more even participation in online settings.

Asynchronous interactions

Linked to the previous point, a range of technology supported modes of generating and providing feedback asynchronously can be built into the concept of the online crit. Students can post work before the live online event allowing everyone to see the work in advance and prepare questions/comments for discussion. Similarly, responses can be offered post the live crit, supported by the digital archiving of work that allows it to be accessed at any time. Delayed forms of feedback give students and staff the opportunity to process thinking and offer reflective comments. Barber notes: "asynchronous discussion forums have the advantage of providing the time for reflection essential for higher order cognitive thinking".[25]

Asynchronous interactions are a significant strength of this approach that can add meaningfully to the in-studio/online blend. Learning management systems and dozens of other digital tools and systems now provide the means to draw, write, annotate, link, record video and audio etc. as part of contributing ideas and engaging in conversation asynchronously, extending the form of the traditional single, closed critique event. Healy says of the blended crit that "Use of online resources and VLE's as part of the crit process can encourage student participation and feedback".[26] The developmental quality of the early stage critique engenders the creation and sharing of research material that builds on specific themes and ideas raised in group critiques. A further use of digital, asynchronous interactions is in facilitating students with this collaborative research work. Using digital systems, everyone can see the research material all of the time, can comment and discuss each other's findings, and construct their own meanings.

Establishing norms and setting expectations

The importance of having met in-person prior to working together online was a lesson offered by the unanticipated teaching situation of 2020. Having had the opportunity to make personal connections and establish a sense of group culture was, in hindsight, critical to studio-based teaching online. Creating a shared sense of purpose and understanding also proved essential. Discussing the use of online modes for studio learning with students, sharing our ideas and expectations, and co-designing our online critique/review sessions was important groundwork. Just as happens in the live studio critique set-up work creates shared values and guides behaviour. For the online studio review this includes discussing the nature of the form and how it is different to the in-person event; how the affordances of the medium can be used to achieve something different to what we expect from the in-studio critique. How we take practices of respectful, constructive and productive feedback into the online mode, for example, and guidance on how to critique respectfully through writing and how to receive written critique. Conanan and Pinkard found that a major implication for the design of technology tools for critiques is that students should be encouraged to build and negotiate shared norms to guide their practice of online critique.[27] The authors suggest that staff explicitly engage in discussion about the ways and purposes of critiquing online stating that "Shared norms could also be established by providing interaction with experts who can model ways of critiquing and sharing expertise".[28]

CONCLUSION

Face-to-face learning will remain the core of the project-based, dialogical, tactile learning experience that defines physical, practice-based studio teaching and learning. What is also clear is that digital technologies can support and extend on-campus experiences in various ways that offer important new learning opportunities. Bender and Vredevoogd describe the use of digital media as "a logical addition to the traditional design studio".[29] The idea of supplementing in-studio learning with online components has become of increasing interest to staff and students not as a replacement for in-person formats, but for the ways it can add something new, something valuable to current practice.

This paper has focused on the studio critique, a core pedagogy in studio learning, offering ideas for guiding principles as a contribution to the ongoing development of online pedagogy suitable for studio.

In summary these are:

- The online critique may be better suited to early-stage events where the focus is more conceptual rather than visual.

- Considered, good quality video, image and audio documentation supports the efficiency and effectiveness of the online crit.

- The intermodal affordances of online communications can extend the way feedback is given and received.

- Online asynchronous discussion forums offer the opportunity for delayed forms of feedback to be part of the critique event.

- Shared understandings of the nature and purpose of the online crit should be developed between staff and students.

- Guidance on giving and receiving feedback in the online crit environment should be provided.

What I have described here sets the online studio critique up as quite a different event to the physical, in-studio critique. Studio crits already range in purpose and form and the online crit is no different in this respect, other than it may be even further removed from the traditional crit, and offer additional

learning not possible in the face-to-face setting. In this regard a change of name to better identify its form and purpose may also be useful; 'the online review' already exists as one possibility.

The studio critique is evolving from a singular event that takes place in a certain space and time into a network of events which happen across a number of sites, physical and online. Opening it up to digital formats has the potential to broaden the experience that this signature pedagogy offers but this must be approached critically. De George-Walker and Keffee, following the criticism of Oliver and Trigwell, warn that "current views of blended learning rarely position themselves from the perspective of the learner and what is actually being proposed is blended *teaching*".[30] A refocusing from teacher to student and from technology to pedagogy is suggested to redeem the concept of blended learning. Identifying the opportunities for the technological enhancement of the design studio through an analysis of its signature pedagogy, Paul Crowther comments that "In selecting an appropriate mode of delivery, consideration should be given to facilitating the appropriate activities and constructing the appropriate situations in which a student may develop their understanding".[31] Activities advanced by online systems offer the potential to extend the learning facilitated by the critique, however, determining what is appropriate and how the affordances of digital components support learning objectives in this context are critical aspects of integration. The design of online components as part of the studio critique challenge us to reflect broadly on the learning experiences enabled by the crit and to consider how new technological and social contexts will continue to impact this signature pedagogy.

NOTES

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[11] Ibid., 3.

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[28] Ibid., 71.

[29] Bender, "Using Online Education Technologies," 114.

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EXPLORING YOUR COMMUNITY: HOW AN INTENSELY STREET-BASED COURSE MORPHED INTO A VIRTUAL OFFERING

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INTRODUCTION

We crawled down a ladder into the impossibly small aperture of the manhole, its cast-iron cover removed for our benefit. Hazmat and fire trucks stood nearby, and city employees in various stages of uniform escorted us, festooned with hard hats and flashlights, through the humid storm sewer running under our campus and past the theater across the street. We crouched-walked along, examining masonry from the late 19th to the early 20th century before we emerged, blinking, into the middle of School Street, around the corner from campus.

It was an unusual but not entirely atypical day for our class, Urban and Community Studies 1300: Exploring Your Community, which specializes in ways to, as T.S. Eliot said, "mak[e] the familiar strange, and the strange familiar."[1] The class, in layers, introduces students to the city surrounding the campus they attend. In turn, they learn to see in new ways and better appreciate their own communities. This particular field trip had several components. It was a way:

- to explore the Great Brook [now the storm sewer], which had once run openly through downtown before the city 'fathers' decided to enclose it because it had become too much of a litter bin for the city's residents

- to think about the city beneath our feet as well as surrounding us, and

- to think about city infrastructure—that invisible stuff that keeps the city running and that we take very much for granted until it fails us.
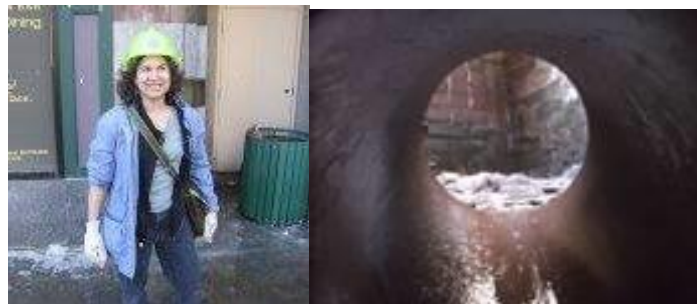
Figures 1 and 2. The author and the aperture described above.

The Context

I should probably say something about the city in which this and other field trips take place. Waterbury, Connecticut is one of those rustbelt deindustrialized cities that cannot seem to reinvent itself. It, and the Naugatuck Valley it is a part of, were the brass capital of the country, if not the world, until plastics, globalization, and a host of other factors brought the area to its knees in the later 20th century. Waterbury is an impoverished city with a hollowed- out core and a population of a little over 100,000. The students have contempt or shame for it if they live in it and fear if they live outside of it. In fact, some of these out-livers have parents or grandparents who dwelled in the city in the golden era of the past, when the factories were running, and the stories they pass down to their children virtually all have the same moral about Waterbury: the past = good and the present = bad. Perhaps needless to say, there is a racial component to all of this. Post-World War Two white flight has sent many white ethnic groups out of the city into suburbs that range from working class to affluent in nature. Meanwhile, in Waterbury and the other small to medium-sized cities some of my students come from, the population is mostly African American, Latin@, and new immigrants. But members of all these groups come to downtown Waterbury to school and converge in my classroom.

What the Course Does and Why

It is my job to overcome the shame or fear students experience regarding Waterbury and get them out of their comfort zones. Part of that starts with creating bonding experiences between the diverse students themselves. Another part is just physically getting students out of the building. Students park in the garage attached to the school; they never have to interact with the street if they don't want to, and most won't venture more than a half a block away from campus.

As a professor of urban studies and a historian, it is also my job in this freshman seminar, titled "Exploring Your Community," to both make the students appreciate the factors that led to the city's decline and current struggle and to appreciate the city's literally and figuratively hidden assets and possibilities. I try to give students a sense of agency rather than helplessness. In the process of the course, in which students generally reveal that they want to move to the Sunbelt, New York City, or Silicon Valley, I gently introduce the decades-old motto of community activists from the Bronx to Los Angeles: "Don't move, improve,"[2] suggesting that students can make differences in Waterbury and the contiguous or nearby communities they live in and as engaged citizens make them into the places they want to live. Along the way, they learn, they can create their own sense of community by working with a variety of stakeholders who also have a vested interest in improving the areas in which they live and/or work. But the first step has involved having students learn to really look and explore what lies around them.

This course, now close to two decades old, has in my hands gone through many iterations before it came to this version. I knew that I wanted students to learn to see the world around them differently, appreciate people of a variety of cultures, classes, and circumstances, and learn about the ways in which they could constructively refashion their environments,[3] but I wasn't quite sure how to do it. After reviewing countless books and articles and trying different ones out, I settled on a mélange of ideas from a variety of scholars and activists. For example, I took to heart and made my students imbibe Harvard professor John Stilgoe's declaration that "outside lies magic" and practice Stilgoe's exhortation to:

Get out now. Not just outside, but beyond the trap of the programmed electronic age so gently closing around so many people at the end of our century…Walk. Stroll. Saunter. Ride a bike and coast around a lot…Outside lies utterly ordinary space open to any casual explorer willing to find the extraordinary. Outside lies unprogrammed awareness that at times becomes directed serendipity.[4]

Former Connecticut Department of Energy and Environmental Protection Director David Leff's related assertion, which he applied to his own small Connecticut town, that "we can sharpen perception and make the most mundane surroundings interesting by learning to read our own everyday landscapes as we would [vacation] places thousands of miles away" has been another important guidepost.[5]

And so the course has been intensely local, entirely focused on places that are walkable from the campus. The students have gone in, under, and around the downtown, often traversing the same space but looking at it in new ways. We have embarked on excursions to 'third places,' that invaluable concept imparted by Ray Oldenberg that leads us to appreciate a precious but endangered institution, the gathering place open to people of all backgrounds.[6] After reading Oldenburg, we put his concepts to the test by visiting a local bookstore/café, where students got to meet the owners and find out about all the community activities they're engaged in, hobnob with the clients, explore the amenities of this gathering place that make for a comfortable place to hang out, and drink a cup of coffee to order courtesy of their professor, a small bribe to reward them for walking two blocks. Other trips have brought us, after other appropriate reading and contextualization, to a variety of nonprofit organizations involved in direct social services, cultural activities, community development, and funding. We have visited immigrant or ethnic businesses such as fledgling Mexican restaurants or African American-owned juice bars or inspected the wares and talked to the manager of a local farmers' market whose nonprofit organization also specializes in imparting food justice through community gardens, food hubs, and nutrition education. Students have learned about and toured local historic commercial architecture, analyzing buildings they had formerly passed by, oblivious. Now they looked up for the first time, noticing and documenting these structures' eclectic styles and rich histories. They learned about the concept of walkability, and took a stroll around the downtown, assessing its level of friendliness or unfriendliness to pedestrians with guidance from New Urbanist architect Jeff Speck's criteria for truly walkable communities.[7] I have guided them through these and other excursions, with the help of local community leaders.

The course has had larger repercussions in several ways. After field trips, students would often on their own frequent the sites they had been introduced to, thus enhancing local businesses and nonprofit institutions and making valuable connections that have served them for internships and job opportunities. At the culmination of the class, the students would each craft a tour of downtown Waterbury geared towards students and other young people. The best of these tours were often used the following fall to introduce students in the Freshman Year Experience, a one-credit class, to both the assets and future prospects for downtown. The tours were submitted, with the written permission of the students, to a variety of community leaders in the mayor's office, the Waterbury Main Street Program, and the Waterbury Development Corporation, the nonprofit development arm of the city, to give these leaders a sense of both what the students appreciated and what they would like to see happen to make downtown a more attractive and exciting place for young people. Knowing that their tours would not just be read [and presumably discarded] by me, could actually make a difference in incoming students' view of Waterbury, and inform public policy in the city made class members much more motivated to do creative thinking, writing, and photographing.

Transitioning the Course to an Online Version

So how was I going to translate this rampant, militant localism in the context of a pandemic with the class going on line and the students not gathered in Waterbury but scattered into their respective communities? To begin with, I decided to make the course synchronous, with once-a-week sessions and lots of interactive posting and small group work. Well, the first part hasn't been so different, as it

consists of students reading background information on the enormous changes wrought in United States cities in general and Waterbury and the Naugatuck Valley in particular—i.e.—to learn why deindustrialized cities such as Waterbury are struggling, and why they look the way they do. Students have had to reflect their understanding of this material back to me and each other through their posts, where they also engage with new strategies for active reading and notetaking or mind-mapping.[8] For this session and every week afterwards, I have done what I call a 'backwards lecture'—that is, I see what students have come up with in their written posts on the readings and other materials, in-class small group work around those posts, and in more general class discussions. I then fashion a written summary incorporating their responses, correcting misconceptions, and providing additional information they may have missed in the reading or that provides context for the reading and fieldwork. In turn, students have had to respond to these weekly summaries and to at least one of their classmate's posts before going on to the next theme and set of readings and other media. Without an in-person classroom, this format ensures more dialogue and provides continuity between one week and the next.

Then, students learn about the Asset Based Community Development or ABCD approach pioneered by scholars John McKnight and John Kretzmann.[9] McKnight and Kretzmann stress that all communities have untapped resources in the skills, talents, and social capital of marginalized people, including the poor, the elderly, and the disabled. Then, that's where things really begin to diverge from the usual 'playbook.' Normally the students and I would play an ABCD-developed board game, where class members explore their own talents and skills and then, after having learned quite a bit about each other, work in small groups, imagining the kinds of nonprofit organizations or businesses they could create by pooling their personal assets and institutional connections. In the new on-line iteration, students research their own towns and cities, creating needs and assets maps fashioned after those modeled by McKnight and Kretzmann, and put them into a collective Google Slides presentation. Then when the class gathers in our weekly synchronous session, they compare their slides, writing comments and discussing the variations in their communities. While this work doesn't get down to the nitty gritty of a personal skills inventory [which perhaps I will add back into the class as an on-line exercise], both the exercise and the collective view of the Google Slides help students to get to know each other and create a sense of camaraderie. At the same time, students are scrutinizing the often-gigantic socioeconomic differences between their communities, using their background readings to understand how we ended up in such profoundly unequal situations in the first place, and contemplating strategies that might alleviate such inequalities.

Then, per usual with this class, we now have the scaffolding to explore community assets in a constructive way. Students do the same readings about third places, ethnic/immigrant businesses, urban agriculture/food justice initiatives, walkability, and architecture and historic preservation as revitalization tools.[10] The difference is in the decentralization. Students now study their own communities and the assets within them, comparing their findings with the readings and with each other through discussion board postings and responses, collective Google Slides projects, class dialogue, and essays. They are not obliged to visit third places or ethnic restaurants in these fraught times, but they must plumb their memories to provide examples of such places and the roles these sites have played in their lives. Students must research their towns' status as food desert or food oasis [or both, depending upon the neighborhoods] and become aware of what organizations, if any, are working to alleviate food injustice.

On the other hand, the exercises on architectural analysis and walkability are tailor-made for solo excursions in pandemic times. Students choose a building that interests them in their community and analyze it both historically and architecturally; they explore a section of their town, decide how

walkable it is, and what can be done to improve its appeal to pedestrians. Along the way, they discover things about their communities that they had taken for granted or never thought about before. Obviously, in some ways it is both more fun and more effective to walk with students around the same downtown, where we attract many bemused glances and some of the 'serendipity' described by Stilgoe. In person, students learn to venture out further into the community surrounding the campus, and then they can impart their observations and revitalization ideas to incoming students and city leaders. Nonetheless, there is much richness to this new approach. Students have an opportunity to learn about their own communities through online research, discussions with friends and relatives, and judiciously chosen site visits. In turn, they can compare their experiences and communities with their peers, discovering the many variations that exist even within this tiny state.

Overall, reactions to this new class variation have been positive. Evaluations from last semester, the first time this class was fully on line, included comments such as:

This class allowed students to become creative and explain [our] personal thoughts in our own community. Each week...has readings that definitely relate to my town which makes it interesting.

I think that this course is set up really well and everything is very interactive even though we are all online. I believe that being able to see everyone's work and comment on each other was great and I would recommend this course to anyone.[11]

CONCLUSION

Through the exploration of community through the lens of community assets such as ethnic/immigrant businesses and nonprofit institutions, and just by virtue of their interactions with each other, students learn to break through stereotypes about people unlike them and communities unlike their own. They learn that even the poorest communities and their members have assets, that immigrants contribute to community revitalization, and that their towns have many important organizations and historic buildings that they may not have recognized before. They create community in the classroom, albeit a virtual one. These are important first steps in learning empathy and feeling a sense of agency, of purpose, and in making their own geographical communities better places.[12]

Figure 3. Sample student picture of building in their community.
Analyzed as part of architecture exercise.

NOTES

[1] Melford E. Spiro, "On the Strange and the Familiar in Recent Anthropological Thought." In *Cultural Psychology: Essays on Comparative Human Development*, edited by Jame W. Swigler, Richard A. Schweder, and Gilbert Herdt (Cambridge: Cambridge University Press, 1990), 47-62.

[2] Activist New York, "Economic Rights: "Don't Move, Improve": Reviving the South Bronx, 1970-2012, (New York: Museum of the City of New York, n.d.), 3.

[3] This course is an introduction to urban studies, but it also fulfills general education requirements in both the social sciences and in a category called 'diversity and multiculturalism.'

[4] John Stilgoe, *Outside Lies Magic: Regaining History and Awareness in Everyday Places* (London: Walker Books, 1998), 1-2.

[5] David K. Leff, *The Last Undiscovered Place* (Charlottesville: University of Virginia Press, 2004), 7.

[6] Oldenburg, Ray. *The Great Good Place* (1989; New York: Marlowe and Company, 1999).

[7] Jeff Speck, *Walkable City: How Downtown Can Save America, One Step at a Time* (New York: Farrar, Straus, and Giroux, 2012); Jeff Speck, "The Walkable City," TED Talk, September 2013, accessed March 13, 2021, https://www.ted.com/talks/jeff_speck_the_walkable_city?language=en

[8] Texts used for this purpose are John F. Bauman, Roger Biles, and Kristin M. Szylvian, "Shaping the Post-War City: 1945-1960, from *The Ever-Changing American City* (Lanham, MD: Rowman & Littlefield, 2012), 32-54 and Jeremy Brecher, "Roots of Powerlessness in the Brass Valley," from Brecher, *Banded Together: Economic Democratization in the Brass Valley* (University of IL, 2011), 1-20.

[9] John L. McKnight and John P. Kretzmann, "Mapping Community Capacity," (Evanston, IL: Institute for Policy Research, Northwestern University, 1996)

[10] Depending on the semester, students also study environmental racism and sustainability, the fragile ecology of locally-owned businesses in a time of e-commerce, the effects of the local Main Street Program on the downtown, abandoned factories and other brownfield sites as potential assets, and examples of street art/arts organizations and private/public partnerships between developers and the city as part of downtown revitalization.

[11] "Student Evaluation of Teaching, Individual Report for URBN 1300-W31-WTBY-Exploring Your Community" (Storrs, Connecticut: Office of Institutional Research, December 2020).

[12] I would be glad to provide syllabi, sample summary posts, and other materials to anyone interested in either the in-person or on-line model of this class. I can be reached at ruth.glasser@uconn.edu.

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PLACE BASED LEARNING IN SKILLS IN SCHOOLS AND SCIENCE TEACHER EDUCATION PROGRAMMES: STUDENT PERSPECTIVES TO MOVING LEARNING ONLINE DUE TO COVID-19

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INTRODUCTION

The development of science teachers requires lab-based, inquiry based and place-based learning in universities and schools. This is inherent to understanding the nature of learning science and associated pedagogy. Place based learning requires the development of teaching skills through working in a community of practice.1

In March 2020, with the outbreak of Covid-19 and lockdown, teacher education programmes had to adapt to a blended learning approach. This project explores that journey across three teacher development programmes within one Higher Education Institute (HEI). The programmes were SKE (Subject Knowledge Enhancement), Skills and Schools and PGCE Secondary Science. It unpicks how the participants responded to that provision and how the TEL (technology enhanced learning) pedagogy evolved.

This paper discusses the approaches taken in overcoming the challenges to deliver place-based learning online, whilst maintaining the essence of social learning and collaborative learning.2 It draws on Salmon's five stage model of e-learning to describe the process and presents insights from a student perspective, drawn from feedback and focus groups.3

The HEI TEL strategy was to make use of MS Teams and Blackboard VLE. Laboratory work and school experiences made use of a combination of videos, home labs and group meetings and taught sessions, which will be discussed.

The unique contribution of this research is that it is a collaborative project that can allow some comparisons to be drawn. Offering lessons to be learnt in improving online provision and TEL pedagogy. The research questions focus on the participants perceptions of learning and reflections on learning.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The theoretical framework underpinning this research relates to social, collaborative learning as well as the development of communities of practice. This theoretical approach not only underpins the approaches taken to respond to the delivery of three teacher education programmes at one HEI, but also underpins the methodology for the data collection in terms of the focus groups, described in the next section.

Communities of Practice & Collaborative Learning

Learning is a social process where there is a relationship between context and meaning.4 This is because learning is located within a relationship between that context and meaning and is inseparable from that social practice.5 This is particularly the case in the learning of science, where the learning involves engaging in practice through participation and critical reflection.6 Learning related to science and Skills and Schools teacher education takes place in a school as well as a laboratory. Over recent years, pedagogical approaches have shifted. The Joint Information Systems Committee (JISC) viewed learning as acquiring competences,7 constructed through understanding, individual or collective, through dialogue and situated learning in a social practice,8 again particularly important for Skills and Schools and teacher education. It is the interactions between the people and structures (school and the labs) that influence each other and facilitate the knowledge generation. If the learning is situated, the participants can learn through legitimate peripheral participation as well as through the Zone of Proximal Development (ZPD). Vygotsky's ZPD requires a learner to be assisted with the development of their understanding and learning through an area of self-regulation.9 The learner receives constructive feedback that guides and moves their learning forward beyond the ZPD.

In this study it was important that social learning environments were established, even though students could not be engaged in schools or laboratories due to Covid-19. This allows students to exchange ideas with their tutor instigating the discussion topic. These groups engaged and collaborated throughout their programmes. The groups took on responsibility for setting up meetings to engage in discussion and feedback. Collaborative learning combines the pedagogies of constructivism and social learning to ensure richer interactions take place between learner, their concepts and their practice. For the SKE and PGCE the practical activities required collaboration for students to develop their understanding of the subject knowledge more deeply. They were able to share and discuss and think about conceptual understanding. With the SKE, this practical learning had to take place online, whilst in the science laboratory for the PGCE. There is still considerable debate as to the importance of the laboratory for learning,10 both the PGCE and SKE courses have always included laboratory experience in order to prepare students for teaching in a laboratory once qualified.

Figure 1 represents the changes made to the communities of practice (COP) due to this transition to online. Figure 1a shows the original COP with students and teachers working in the lab or school. Figure 1b is the COP required for this transition that worked alongside the Figure 1c COP. Figure 1c COP has the addition of the online environment that replaced the school or laboratory.
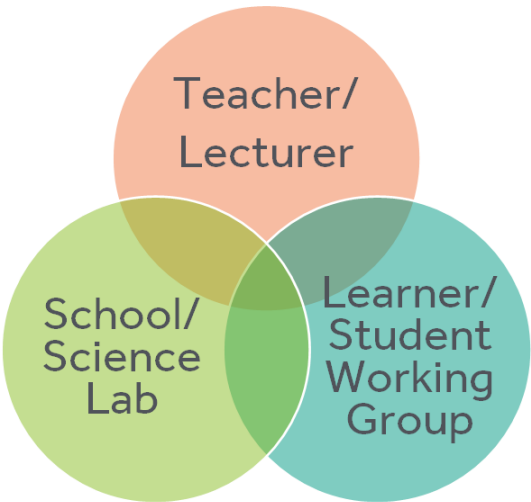
Figure 1a. Original Communities of Practice
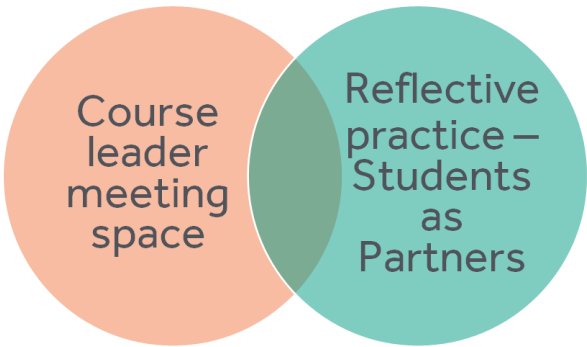
Figure 1b. Transition Communities of Practice
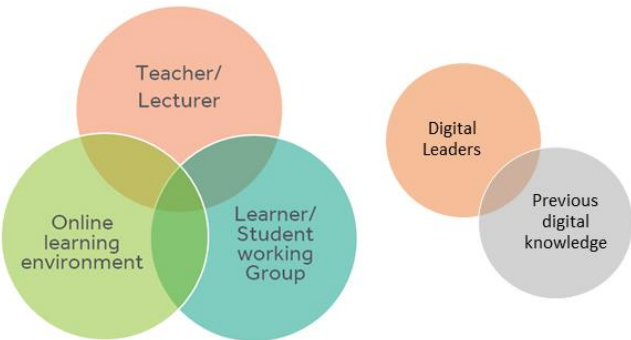
Figure 1c. Online Communities of Practice
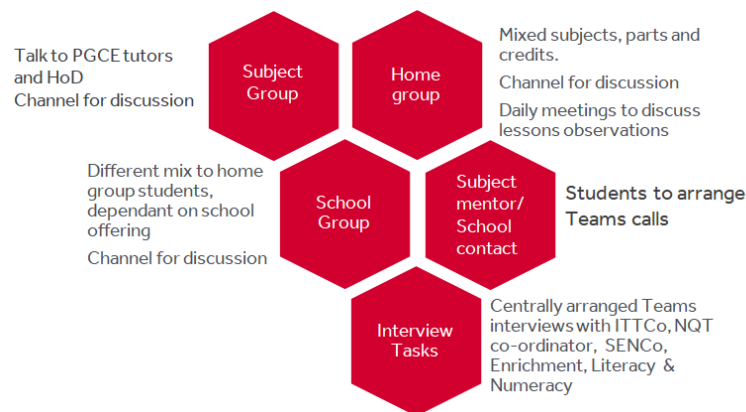
Figure 2. Skills in Schools Group Organisation.

Learning Outcomes for Skills in Schools include development of collaborative skills. Explicit opportunities were provided to replicate being in school, observing lessons, discussing with peers, interviewing key staff (Figure 2).

E-Learning & Technologies

Gilly Salmon presents five stages to teaching and learning online that helps to explain how that learning is facilitated and how learning is effectively scaffolded in this online context. It provides a framework for enhancing active and participative online learning; describes the process for the moderator (teacher) and learner (student); describes how to motivate online learning whilst building on e-tivities; pacing e-learning through stages of training and development; and how to e-moderate. This is described retrospectively in the results and discussion section below.

The technology used was driven by the University strategy, training available and ease of use or familiarity. We attended CPD sessions and conducted meetings via MS Teams. Bb Collaborate was not as user friendly. Blackboard was used in a conventional way for resources and course content. MS Teams facilitated student group meetings and tutorials. MS Teams was used for conducting the live practical sessions, or introductions to course content. Table 1 shows an overview of the use of technology across the three programmes.

	Skills in Schools June 2020	SKE June 2020	PGCE September 2020
Instruction for technology access	Screencast walk throughs Live demo	Email information and screencast	Screencast walk throughs Live demo
Instruction for assessments	Screencasts to support written instructions	Collation of e-portfolio through Bb submissions	Screencasts to support written instructions
Practical lab work	N/A	'care packages' video demo Home lab work PHET and GoLabz simulations	Lab work in labs with social distancing and control of numbers. Lab work adapted.
Lesson Observations	Use of training videos	Malmesbury School Videos of Required Practicals	Was in schools as normal
Pre-recorded 'lectures'	Flipped learning	Flipped learning	Flipped learning
Live lectures/seminars	To facilitate discussion & deliver content	To facilitate discussion & deliver content	To facilitate discussion & deliver content
Progress Assessment	Daily e-journal	Blackboard upload	E-portfolio

Table 1. Overview of use of technology

METHODS

Design & Methodology

The research design mirrored that of the development of the communities of practice. It was a collaborative and iterative process that helped to explore student perspectives due to a shift to online learning. It involved gathering feedback from undergraduates and post-graduates engaged in three programmes: Skills and Schools, SKE and PGCE Secondary Science. An online Microsoft Form was completed by all students to provide initial feedback, and then those who consented were asked to engage in a Focus Group. These focus groups helped to draw out greater insights, providing rich descriptions and qualitative data. The thematic analysis of the data helped to draw out key aspects in terms what students had found useful and things that were seen as issues, so that this feedback could help academics improve their programme development the following year.

Participants & Sampling

All the students from three programmes (120 Students) were asked to complete an online survey. 26 students (+20%) consented to engage in the focus groups and these were split into four groups. Each group (6-7 students per group) were asked to review the same discussion points (appendix 2), which were developed from the initial feedback. The students were undergraduate first/second year students (age 18-20) and post-graduates (age 24-48).

Design & Methodology

The project took place from January 2021, with focus groups in February 2021, and paper submission in April 2021. The programmes ran from March 2020 for the SKE and Skills and Schools

Programmes, and September 2020 for the PGCE Secondary Programme. The research instruments included the use of MS Forms for initial feedback (January 2021). Then follow up focus groups, to last no longer than 45 minutes, to allow students to engage in richer conversations (February 2021). A decision was made to use MS Forms and focus groups through MS Teams as we were still in a situation where engagement with students was online.

Research Instruments

The project took place from January 2021, with focus groups in February 2021, and paper submission in April 2021. The programmes ran from March 2020 for the SKE and Skills and Schools Programmes, and September 2020 for the PGCE Secondary Programme. The research instruments included the use of MS Forms for initial feedback (January 2021). Then follow up focus groups, to last no longer than 45 minutes, to allow students to engage in richer conversations (February 2021). A decision was made to use MS Forms and focus groups through MS Teams as we were still in a situation where engagement with students was online.

Data Analysis

Thematic analysis11was used to draw out the key themes from the focus group discussions. These were then categorised as the issues raised, the things the students liked and the aspects for further development. In addition, the academic staff reflected on what they would continue to do in the next academic year.

Ethics

Ethical Approval was sought following BERA Guidelines and University procedures. Students were briefed about the project and required to give their consent. Students were invited to complete the MS Form and attend the focus groups via email. The main ethical consideration was that we did not have an academic who had taught on the programme introducing the focus group. It was also important, where possible, that the students led the focus group discussion and allocated a student moderator at the beginning of that focus group session to lead. This provided all participants with the opportunity to contribute.

RESULTS AND CONCLUSION

In removing a key element of the COP (science laboratory and school) we needed to ensure that students still had the same opportunities to collaborate with all the key aspects of that practice they were learning about. The students stated that they:

'… *particularly enjoyed the collaborative engagement with both my colleagues and our tutors. Given that these were unusual circumstances, it was important to maintain a strong team spirit as I felt that this gave us all mechanisms to cope with those times where things were daunting, confusing etc… but also it gave us all moments to share successes and achievements, all of which helped progression through the course. I felt that we had the right blend of help and support from our tutors, with good input balancing space for us to collaborate effectively*.'
Student Feedback initial evaluation

'*I enjoyed "meeting" my SKE buddies and getting to know my new colleagues. I enjoyed A Level Practical Week and found some of the online tools for experimentation and demonstrating experiments very helpful*'
Student Feedback initial evaluation

22/100 responses on MS Forms showed students' excitement of doing practical work, and the experience of using things online that they could then use in their own teaching practice:

'...the excitement of receiving the pack of goodies through the post was real and I enjoyed that element of the program and it's been genuinely useful. I've used some of those experiments that we did in the classroom and as PERSON B said virtually as well.'

Student Feedback MS Form

'...some of the online simulations that we used in our SKE we've used (with pupils). I certainly have used them while we've been doing online learning last half term, like the PHET simulators and things like that…'

Student Feedback MS Form

The students who consented to engage in the four discussion groups (5 participants per group = 20 participants) highlighted the benefits of the online group engagement:

'I just wanted to say, really. It was it was a credit to the team that delivered the SKE that it got my subject knowledge to a level where it needed to be, so I know that the people had to react quickly to deliver the program in a different way…'

Student Feedback Focus Group

Table 2 shows an overview of aspects students found useful and key issues. The third column highlights suggestions for improvement.

Programme	Useful	Key Issues	Suggestions
Skills & Schools	• Training to work online at the start • Easy instructions & structure clear • Working in groups • Flexibility as to when to meet • Interviewing the teachers	• F2F would achieve better quality conversations • Videos outdated • Independent Learning	• **More support for enabling rich conversations online with 'strangers'** • **Source new video material** • **Ensure students understand when to work collaboratively and when independently**
PGCE	• If completed SKE found it easier to navigate Bb and work in small groups • Staff responded and improved provision • Fruit groups • Week by week organisation on Bb	• Navigating Bb across different areas – PS, Subject, Assignment etc… Whole cohort not as well laid out as subject – meeting sessions/ break out groups • Two versions – pre-pgce and pgce • SKE laid out different to PGCE • No time to socialise/chat during taught sessions even when F2F • PS Sessions too long for online • Amount of screen time difficult to manage – particularly if learning difficulties	• **Pre-tutorial/STREAM on how to use and navigate Bb areas** • **Scheduled time just to catch up** • **Consider screen time, chunking up, slimline content** • **Clear instructions in ONE place for online sessions, how to join etc..**
SKE	• Clear structure and materials on Bb signposted • Short guidance videos • Resource packs sent home for home lab work • Small groups for group task/tutorials	• No Lab Practical • Those with families found it difficult to complete work • During practical weeks, there was a lot of other content to cover • Expectation of being taught Subject Knowledge – core content	• **Develop initial skills to work online** • **Priorities CORE content and ADDITIONAL content and make explicit** • **Key Learning Outcomes** • **Focus on Practical during practical weeks** • **Week by week on Bb** • **Schedule taught content**

Table 2. Overview of key issues, useful aspects and suggestions

What we learnt

We learnt that even with these limits on engagement related to accessing schools and science laboratories brought about by Covid-19 we were still able to engage in an integrated learning model. The one thing that had changed was 'place'.   Figure 3 shows the integrated learning model underpinned by constructionism, adult learning theory,[11] reflective practice,[12] collaborative and social learning.[13]

Figure 3. Integrated Learning Model

Academics engaged with students through breakout groups and students engaged with students through group discussions. Students shared their inputs through CHATs with photographs, short videos or commentary. Students took responsibility to lead sessions, to set up sessions and collaborate. Work based learning was taking place through these aspects of shared practice, home labs and virtual labs.

We were able to reflect on Gilly Salmon's 5 stage model for e-learning online[3] and demonstrate these stages had been followed. Next year, when designing e-tivities we will use Salmon's e-tivities template to facilitate this process.

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SPACE AND SERVICE DESIGN - TAXONOMY, DESIGN AND TEACHING PRACTICE

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INTRODUCTION

Contemporary global challenges such as social inequalities, ageing, health crises, nature disasters have encouraged designers worldwide to scrutinise their role in these matters and to respond with design solutions. Triggered by contemporary social, cultural, environmental and economic challenges, Thomas More University of Applied Sciences (TMMA) in Belgium, developed since 2016 an international postgraduate in Space & Service Design (SSD). This paper describes how this discipline originated from a bachelor course with a traditional spatial emphasis, to a postgraduate focussing on systems of services and supporting service spaces. By utilising only real-life projects and involving real clients and users, an authentic learning environment responds to the demand of predominately regional partners by improving their service environments and user experiences. Over the past six years a design thinking methodology based on service design methodology has been developed; combining intercultural and multidisciplinary, participatory and user-centred, interaction and social design approaches.

Empirical research and educational practice evidenced that existing service design methodology and tools only provide limited responses to the transdisciplinary approach of spatial design and service design. The need arose to provide more instruments, methods and tools, to aspiring (student-) designers that enable working on real-life, socially relevant projects, and appraising the initial user-scenarios and spatial situations. After all, the multiple layered space and service design projects, involving various stakeholders and disciplines, therefore deal with wicked problems. This paper elaborates on the taxonomy system and space and service design tools, established through maximum variation sampling and action research, simultaneously addressing services and spatial touchpoints. It provides critical reference points for educators, students and clients which allows the comparison of the pre-intervention situation and the intended impact of the adapted space and service. The Space and Service Design tools (SSD-tools) can support face-to-face and online education and design practice, in holistic problem-solving.

FROM TRADITIONAL DESIGN APPROACH TO SPACES AS SERVICE PROVIDERS

Worldwide phenomena over the past decades have had an important influence on society and encouraged designers to respond with design thinking methods and design solutions[1]. Consequently, new design disciplines, s.a. social design, strategic design, interaction design, service design, and new design approaches, s.a. user-centered design, co-design, multidisciplinary design, have been

established. These concepts can be applied to traditional design disciplines for example product design, graphic design, interior design or architecture. What the emerging disciplines and approaches have in common is the idea that design thinking can be the basis to solutions for contemporary challenges, while traditional design disciplines aim at designing tangible products in the first place[2].

One of the emerging design disciplines is space and service design. Shifting from a traditional spatial emphasis towards a user experience-centered approach, the discipline aims to add value for users of service spaces and contexts[3]. When organizing a specific service, there are always tangible components, referred to as touchpoints, essential to realize the intangible service for example a website, brochure or app, a device to assist the user, a space, room or building to host the service. The user interacts with these appliances. A deeper understanding of how services and spaces interact is subject to research of, for, and through design[4].

Shifting towards authentic space and service design learning environments

In the bachelor of Interior Design at TMMA, established fifty years ago, students are traditionally taught to understand and apply the language of shapes and forms, to create proportions and configurations of spaces and functions. Manufacturability, technical appliances and materialization are key factors for a solid practice-based design project. Space is considered as an aesthetic container and end result of a design assignment.

Triggered by global and local societal challenges and innovation in design practice, a postgraduate in Space and Service Design was developed. In this specialization program, the education of designers moved from the concentration on creating things towards a preoccupation with designing to serve people with their specific needs, acting in specific contexts[5]. Some define it as a new discipline [6], others as an evolving design attitude that includes a holistic approach of services from the user's perspective[7]. Be that as it may, these new concerns and contexts entail an alternative educational approach.

In a conventional spatial design process, many designers and design educators follow the Double Diamond model [8]. In SSD education, this model is supported by service design approach and tools[9] in order to offer the students authentic knowledge, skills, and attitude. We consider SSD as a system of spaces, objects, communication and services jointly capable of fulfilling the user's need. Tangible spaces stimulate the ongoing use of intangible services and simultaneously evidence the existence of a service. The spatial service system defines the scenarios for continuous interaction between people, spaces, objects, and communication tools, identifying the services.

Key values of Space and Service Design

Design Flanders[10] formulated the key values of service design: user-centered, iterative, holistic, sequential, qualitative insights. Through literature study and action research we refined the key principles for SSD which function as the basis for the teaching methodology to user-centered, stakeholder involvement, sequential, holistic, system thinking, evidencing, testing and physical context research. Iteration is standard when using the Double Diamond. Both qualitative and quantitative research outcomes can provide the necessary information to support the design process and lead towards relevant solutions.

In order to meet the first key principle, 'user-centeredness', one has to reassure that tangible spaces and objects and intangible experience are desired and user-friendly. To this end, the client, end-users and stakeholders are closely involved throughout the design process. In their role as professionals or user-experts, they provide the aspirant designer with information; as future-users they give feedback or are co-creators of design ideas and concepts[11].

The design assignments in the SSD program cover only real-life design challenges to enable the involvement of actual users and 'stakeholders' throughout all design phases. This allows students and lecturers to arrive at authentic insights and desired outcomes. By improving the user's experience, (emotional) profit and efficiency develops and costs are reduced. All users are consciously taken into account. Student research teams investigate through surveys, interviews, and observations, the users' journey(s) within the existing and future spatial context. By generating personas they are able to focus on specific needs and dreams of user groups. The student-designers are taught to orally and visually communicate their research, ideas, and design outcomes in a comprehensible manner for all stakeholders, hence also non-designers. They apply user-centered tools such as SSD Spatial service system maps and realistic story boards including all touchpoints in order to support the dialogue between the different parties.

By 'testing' their design proposals through pitches, mock-ups and prototypes with clients and users, the aspiring designer checks whether the design is a response to the actual needs and dreams of the client and end-user. Moreover, he aligns with the client's requirements and expectations.

The design process is an 'iterative process'. Hence, the knowledgeable users are involved at different stages in the design process and for specific underlying components or sub-functions, if relevant. After all, a designer is not a nurse or a teacher, nor a librarian or social care worker. The consequent involvement of the stakeholders is essential in gaining up-to-date, accurate insight information about the specific context one is designing for.

Each phase of the user's experience of the service 'system' is supported and 'evidenced' by a logical space or environment with relevant objects and communication tools. The system predicts user interaction, money flows and flow of goods, the system implies efficient and appealing communication channels. SSD is 'sequential'. As well the pre-service, service and post-service are determined.

SSD requires a 'holistic' approach. Designers equally address the touchpoints – including buildings, broader context, wayfinding, communication tools, furniture, technologies - as the intangible scenarios, interactions and experiences [12]. Consequently, all touchpoints should be composed as a well-orchestrated entity to respond to often wicked problems. Since these touchpoints belong to different design disciplines (spatial design, product design, visual communication design, UX design), SSD demands multidisciplinary teamwork, so as to realize holistic spatial service systems. The involvement of designers with different cultural backgrounds facilitates designing for multi-layered societies.

SSD briefs entail a thorough research of the tangible and intangible context. Design research teams conduct mainly qualitative research, using techniques such as (group) interviews, site visits, service safaris (a service safari is a qualitative research method that allows designers to experience the service first hand on site and gain a deeper understanding of the service system) – as illustrated in figure 1, workshops with users, body storming, observations. They communicate qualitative insights via user-friendly research presentations and reports, personas and giga-maps (maps of service environments comprising all qualitative, negative, tangible and intangible elements of a service environment). The stakeholders can use the visually clear reports and posters in their turn in the communication towards users, for fund-seeking and in the realization of projects.

Figure. 1 SSD Service safari – Design for ageing – Elderly community De Lisdodde in Mechelen. (Thomas More, 2018)

FILLING THE GAP

Social design, user-centred design, co-creation, and participatory design are already applied in the design of public spaces and buildings. However, drawing from literature, service system design thinking is seldom explicitly incorporated into conventional interior design, interior architecture or architectural design methods [13]. Although the former are approaches of service design, there is little explicit reference within the vocabulary of architectural or interior design to that of the design of services.

Space and service design taxonomy and tools

Between 2014 and 2020, the Design Department of Thomas More received twenty-five design requests from public services and NGOs. Based on a comparative analysis of the design challenges, there is always a space, spatial object or context, involved in the design process. Through maximal variation sampling [14] four types of baseline situations were distinguished from these twenty-five requests. A Space and Service Design Taxonomy was developed in order to support students in determining the existing situation of a space and service design challenge – as illustrated in figure 2.
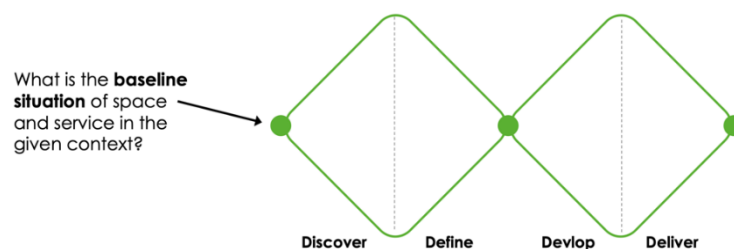
Figure. 2 The unsecure starting point in The Double Diamond design process model (British Council, 2015).

There are four possible baseline situations which require different approaches: in some cases the service provider already has an existing service space, sometimes there is no designated service environment yet. In some cases there are already services offered on site, in other situations there is a service concept but no developed services nor service touchpoints.

A SSD Taxonomy tool provides information on the situation the design aims to change and critical reference points to compare the baseline situation to the effectiveness of the adapted space and service. The baseline situation influences the choice of SSD design methods and tools supporting the design process. In order to adapt educational methodologies and practices for SSD, the research question "Which tools can facilitate the phases of the design process and include both spaces and services?" arose. The research goal was to use integrated SSD tools and methods that simultaneously incorporate tangible as well as intangible features of a service, and will guide designers throughout the entire design process.

Firstly, a comparative literature research of service design tools (n=32) was conducted. Analysis revealed that only a small number of tools considered 'the spatial environment' as an essential touchpoint. Although existing service spaces always host a prevailing service [15], the investigated service design tools offered little opportunity to evaluate or elaborate on existing service contexts and none carried the spatial data throughout the entire design process [16].

The literature review concluded that prevailing service design toolkits provide inadequate responses to space. Moreover, the methodology for spatial design projects comprises no explicit and structured approach to parallel managing spatial and service design.

The selection and testing of existing tools which address space and service simultaneously was the consecutive step in the research process. Next to that, the aspect of 'space' was added to adopted existing tools to create new tools and methods. Action research with real-life clients, public service organisations, and NGO's, revealed that different baseline situations demand the use of different tools. Hence, sometimes an organisation already operates on an existing location, thus the spatial context causes limitations and constraints. Sometimes an organisation already offers services on site and sometimes they do not. Applying the correct tools is not always self-evident. Therefore, the SSD Taxonomy system helps to distinguish different baseline situations. When the design of space and service design goes hand in hand, one needs to research the tangible and intangible context in order to be able to define the design challenge [17].

User-centered approach, combining face-to-face and online interactions

The current COVID-19 health crisis caused profound social and economic disruption. Universities across the globe were forced to adapt their teaching methodologies and organise distance education. Some universities already had a tradition of online education whilst others struggled with transitioning to a new era[18]. The following part of this paper illustrates how the postgraduate course in Space & Service Design in Belgium responds to the emergency transition.

Previously this paper emphasized the importance of interaction with and involvement of users and stakeholders in gaining up-to-date and genuine information. They can participate as trend-watchers, test panel, co-designers, usability testers, co-creators, co-owners and evaluators[19]. After all, the users will convert the final service design into service practice.

SSD briefs demand thorough research of the tangible and intangible context. Multidisciplinary student research teams conduct qualitative research of/through design, using techniques s.a. individual semi-structured interviews and group interviews, co-creation workshops, user observations, service safaris, interviews with cultural probes, user journey tools, giga-mapping, storyboards, SSD moodboards, SSD prototyping and testing.

The developed SSD tools support the investigation and development of tangible and intangible service components. Based on action research and in the light of remote working we can categorize the SSD tools and methods in three groups – as illustrated in Table 1. First, tools and methods, initially applied in a face-to-face setting, which can be applied online. Second, tools originally used in a

designer-service provider/user setting that can be used by the user alone or assisted by an expert or service provider. The third category is the group of methods which cannot be replaced by remote actions because they require essential activities on site in order to gather reliable and authentic data. In-person interactions with users cause less thresholds than remote interactions. Moreover, body language is an unparalleled type of person-to-person interaction.

METHOD OR TOOL	*DESIGNER SHIFTS* FROM FACE-TO FACE OR ON SITE (INTER)ACTIONS *TO WORKING REMOTELY*	*SERVICE PROVIDER ASSISTS* THE DESIGNER	*DESIGNER SHIFTS* FROM FACE-TO-FACE OR ON SITE (INTER)ACTIONS TO ONLINE *INSUFFICIENT VARIANT*
Team canvas	_online via Miro		
Service site visits		_making footage or pictures	_Google streetview, _plans, pictures
Service safaris		_making footage or pictures _applying SSD Future user journey tool	
Giga-mapping			_Online research _Google streetview
SSD Resources checklist	_on Miro		
SSD Interview tool			
SSD Priority charts			
SSD Design challenge			
SSD Future moodboard through designer glasses			
SSD Spatial service system map			
SSD Future stakeholder map			
SSD Service space touchpoint matrix			
Face-to-face communication with client and users	_Teams, Newrow, _closed social media groups _email		
Individual interviews	_online interviews via Teams, Newrow using SSD Interview tool		
Group interviews		_	
Co-research workshop with users		_applying SSD Cultural probe kit _applying SSD Current moodboard	
Co-design workshops with users		_ applying SSD Future moodboard	
Testing		*SSD Future user scenario*	
Future user journeys	_ 2D user journeys e.g. on Miro		
Multidisciplinary teamwork	Working with Miro, MS Teams		

Table 1. Overview of the three categories and possible online alternative tools or methods.

Interdisciplinary design teams can still collaborate effectively online using e.g. Miro as virtual platform to archive research content, to ideate and to collect design outcomes, to coordinate and document the Double Diamond process. They conduct individual interviews online, using online communication apps such as MS Teams, and supportive tools such as the SSD Interview tool and the SSD Current user journey tool.

Stakeholders and users can, if carefully informed and instructed, conduct parts of the research themselves: they make moodboards of current services and service spaces, they create video diaries or complete SSD Current user journeys which allow indicating the quality of the service experience through users' eyes. They reveal day-to-day experiences with the SSD DIY cultural probes kit - as illustrated in figure 3. If a service provider assists to the research activity of or with the users, the activity is more likely to be successful. For example, nurses in an elderly care facility can conduct interviews with residents with the assistance of a SSD DYI cultural probes kit; the physiotherapist can assist elders in creating a moodboard of the current living environment by offering physical help, equipment and guidelines. In a solid co-creation process, the kitchen staff can test a new user journey in the light of the improvement of meal experiences for elders.

Figure. 3. SSD DIY Cultural probe kit - Design for ageing – Elderly community Cuypers in Stabroek. Kit composed by SSD students De Coen, A., Vande Kerckhove, S., Mehralian, S., Vonckx, K. (Thomas More, 2020)

Several methods and tools are solely based upon live experiences and therefore not fully replaceable by online variants s.a. a service safari. Interaction with customers, staff, and service touchpoints are part of the service safari. Focus group interviews and co-creative workshops entail interactions between participants through exchange of viewpoints and ideas. A virtual environment is an obvious thresholds and the dynamics will be captured less. Testing design prototypes with users requires realistic environments and real users. Giga-mapping requires site visits to be accurate.

CONCLUSION AND RECOMMENDATIONS

Space & Service Design is an emerging discipline simultaneously addressing the design of services, service environments and touchpoints in order to create holistic user-centered design solutions. The postgraduate course in Space & Service Design at Thomas More University of Applied Sciences works demand-driven on real-life projects, involving clients and users whose request is to organize or improve their service spaces and user journeys.

Shifting from a traditional spatial emphasis to a holistic user experience approach entailed the development of a new design thinking methodology supported by new methods and tools, combining participatory, multidisciplinary, user-centered, interaction, and social design approaches.

Ongoing empirical research revealed that the developed SSD tools and methods were found to be applicable for online use. However, in case a design team is not able to interact with the service provider on site or face-to-face, the service provider can assist in the design process by taking over a part of the role of the designer and with the aid and instructions of the SSD toolkit, for example in organizing workshops with users or stakeholders. In addition social media, communication and collaboration apps can support the designers throughout the design process.

Be that as it may, various essential in-person methods cannot be equally replaced by virtual experiences without losing the added value of the dynamics and authenticity of live interactions. Uncovering the emotional perception of the users' experiences by means of virtual methods is more difficult. Research about the effectiveness of the online use of tools versus face-to-face methods are subject to future research.

Design outcomes showed that SSD multidisciplinary teamwork benefits from using collaboration platforms such as Miro, allowing to create, collaborate, and centralize communication and information across a class or a team. Also the quality of the conveyed visual output improved in terms of comprehensiveness for non-designers. Further research about and the development of visually clear and accessible client communication tools, as well online as face-to-face, is recommended.

To conclude, the aspiring designers showed great flexibility and initiative in dealing with online design challenges, or hybrid and blended learning methods. Nonetheless, designer-students and lecturers indicated that they preferred genuine live interaction with peers, lecturers, clients and users.

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RETHINKING THE CRIT: LESSONS FROM THE ONLINE WORLD

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INTRODUCTION

This paper is framed within the *Rethinking the Crit* research project which is funded by the National Forum for Teaching & Learning, Ireland. It is a participatory action research study which trials and evaluates the impact of alternative feedback systems for students of architecture and the creative arts, compared to the traditional crit. The partners in the pilot research project are the Schools of Architecture of TU Dublin, UCD and SAUL along with the Crawford School of Art in MTU.

This paper will examine the pedagogical theory underlying the traditional 'crit' approach, discuss recent critiques of the method and the reality of the 'crit' will be examined through analysis of practice. This will lead into a discussion of our experience of how the move online has opened up new possibilities for the research project. We will seek to identify what we found of value to retain as we move slowly back into the real space of the design studio.

Our paper is broken into three parts:

The first on the *Rethinking the Crit* project

- Why is the Crit the way it is?
- What is at play?
- Where can it be improved?

The second will look at an example of the application of the project online

- How have we coped with change?
- What formats worked?
- What is the feedback?

The last part will ask Where next? What will remain?

RETHINKING THE CRIT
Why is the Crit the Way it is?

In examining feedback in the process of Architectural Education, Banham's essay, *A Black Box: The Secret Profession of Architecture*[1] compares the teaching method somewhat unfavourably to a tribal long house with the enforcing of a code of conduct, establishing attitudes and values that are then played out in the profession. Students absorb aesthetic, motivational, and ethical practices as well as language broadly speaking in what Bourdieu [2](1990) refers to as habitus i.e., embodied manners of seeing, acting and thinking.

Sevgi Türkkan's research points to the importance of Alberti's book from 1485 *On the Art of Building* in the making of the construct of an architect. It announces the idea of the architect as sole author. In the design process the architect applies absolute authority and claims ownership and credit.

"They must calculate … the amount of praise, thanks and even fame they will achieve, or conversely…what contempt and hatred they will receive." [3]

Figure 1. Till: What are Crits For? Jan. 2016

What is at play?

This brings into focus the architect's judgement, as it is by this judgement that an architect is valued. This is what the architect contributes to society in relation to the design process, and, by the result of such actions they themselves are judged.

This idea of the architect as sole author and judge of what makes good architecture is then played out in the field of education via the crit[4].

The crit is the established 'doxa' as identified by Bourdieu[5]. Bourdieu describes the 'doxa' as that which is taken for granted and understood by the whole group in an unquestioning manner; the enacted belief of a group. The crit is understood as where the tutor's judgement of what successful architecture is is revealed[6].

We have experienced an enforced change in the 'panic pivot' to online learning. In our case the spatial setting for the crit has disappeared and has been replaced with the online world.

But it is not just the physical space that has changed. We now have a situation where the locus of control is also shifting. Figure 2, shows an extract from a series of diagrams tracking the movement of the students during a crit. The tutors at the front while the students sit towards the back in a less engaged manner. With the tutor(s) at the front of the room surrounding the student who is presenting, this is a physical manifestation of the spatialisation of power as defined by Foucault[7].

HOUR 2~3

STUDENT PRESENTING
STUDENTS OBSERVING
TUTORS
STUDENTS WORKING
STUDENTS AT COMPUTERS / NOT WORKING

LINE OF DIALOGUE
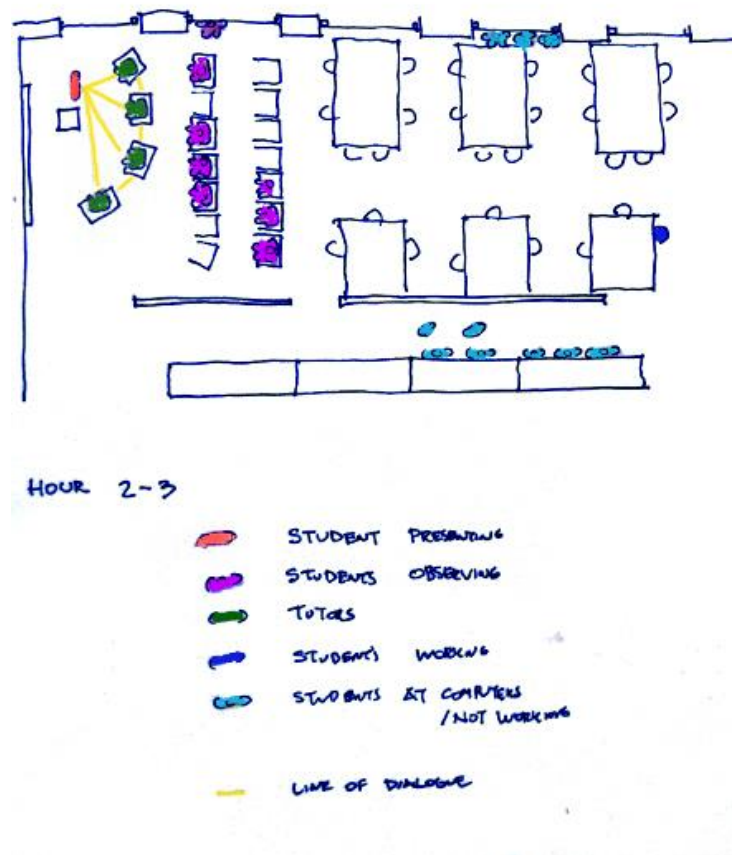
Figure 2. Plan of Traditional Crit 07-04-17

Where can it be improved?

If we explore what the Crit aims to do, we can examine McCarthy's[8] research which indicates that the most successful design studios are those where traditional power relationships are broken down. These are studios where the students become actively involved in the process, and where they can discuss their work with jurors and with each other[9][10]. The most successful variations to the traditional jury format, from the students' point of view, are those where they are more involved in the process of active learning be it online or in person.

FEEDBACK TYPES IN TERMS OF AIMS	Crit	Commit	Submit	Rehearse	Exhibit
	Traditional Crit	Round Table	Written Feedback	Pin up Discussion	End Review
Sharing the **power-base** more equitably between the design critic/teacher and the student in the presentation of student work		■			■
Being more **time efficient**				■	
Providing a greater **variety of meaningful feedback** for students	■				
Providing a low level of **stress** to promote **productivity**		■		■	
Involving **active-learning** techniques	■	■		■	
Supporting the ambition to have design feedback format which contributes to the **preparation** of students for the profession	■	■	■		■
Enagaging the students in the presentation of the work of their peers	■	■		■	■

Figure 3. Table for aims of Traditional Crit and Alternatives (after Mc.Carthy[11])

What is the feedback?

The pilot project was reviewed as part of the two-day seminar called *Rethinking The Crit* held in January 2020. The symposium brought students together with staff and international experts from the US and Europe to co-create ideas around feedback and learning alternate to the standard 'crit'. This allowed us to consider pre-Covid how to challenge the doxa.

This research combined with an enforced change now places us to measure what has succeeded and to allow us to challenge the doxa with our newly acquired knowledge. We can in the Bourdieu sense explore heterodoxy which is about the challenge to what is taken as the way to do things.

Dutton pointed out the main problem with the traditional crit format is that it is not dialogical because of the structured asymmetrical relations of power. "No dialogue leads to less learning opportunities*"* [12]. The online world can in contrast mitigate against this along with Foucault's identifiable spatialisation of power. The crit in moving online is now not bound by a particular space. Now is our chance to reimagine it as a discussion between the staff, the students and other outside voices co-creating knowledge in a blended learning environment in the future post-COVID.

Figure 4. TU Dublin In person Roundtable Review 05-03-19

RETHINKING THE CRIT ONLINE
How have we Coped with Change?
So how does a Doxa get challenged? It can emerge through a critique or external force. In our case it is a combination of the research project and the change because of an external force, i.e. COVID. The crit that has been central to architectural education for close on one hundred years where students present their work in a public setting and oral feedback is delivered to them by the jurors is temporarily not possible. It is an enforced change – leading us to a key moment in architectural pedagogy.

This, combined with the earlier research allows a questioning about why we do things the way we do. It allows us to challenge the doxa and move away from the sole author idea of an architect who is judged to one that works in an online world where collaboration is key.

What formats have worked?
We will illustrate, using one example, how this combination of the *Rethinking the Crit* research project and the external force of the move online presents opportunities to develop the pedagogy of the Crit.

The alternative review format used is known as the "Roundtable Review", proposed by the project derived from the Harkness Method[13]. Students present work in progress and receive verbal and sketched feedback from student, guest and staff reviewers, all sitting around a table.

UCD second year architecture studio first tested out this format pre-Covid in Feb 2020. Feedback was positive from staff and students. It was then used online in 2021 while Ireland was under lockdown.

The aspect of Roundtable Review that particularly appeals is the emulation of design practice discussion while a project design is developing. At the heart of the pedagogical practice of Stage 2 is

the idea that architectural design is a shared collaborative endeavour. We aim to equip students with the skills to navigate this collaborative learning space by enabling them to become an active participant in their learning. This is where we have found that the Roundtable is more effective when compared with a traditional crit –where a student often stands alone, and thus takes a defensive yet also vulnerable and passive stance to "receive"[14] criticism. At the Roundtable, everyone is sitting, everyone has a say, and everyone is heard.

Online, we were able to create a virtual space that would support these inclusive and non-hierarchical principles of creative cooperative working thanks in no small part to Miro and Zoom – digital platforms that have developed considerably in the last year. We used Miro to provide a visual structure for the Roundtable Review, setting up 12 review 'tables' and one Zoom call with 12 break-out rooms for 80+ staff and students to discuss and develop the projects.
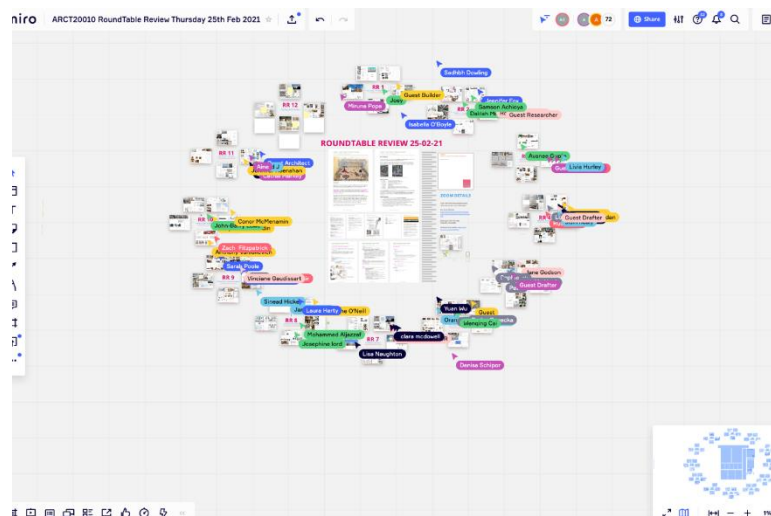
Figure 5. Roundtable Review, UCD 25-02-21: Overview of Miro board while the review is in progress

Miro enabled the work to be viewed collectively but also zoomed in to review 'tables' and individual projects, while providing sketched feedback. Using Zoom in parallel meant that the whole group could meet at the start to introduce the session and at the end for concluding thoughts, and in between to work in breakout rooms for each 'table' discussion. This allowed us to create a collective event that had momentum, possible in the face-to-face setting, but hard to recreate online.
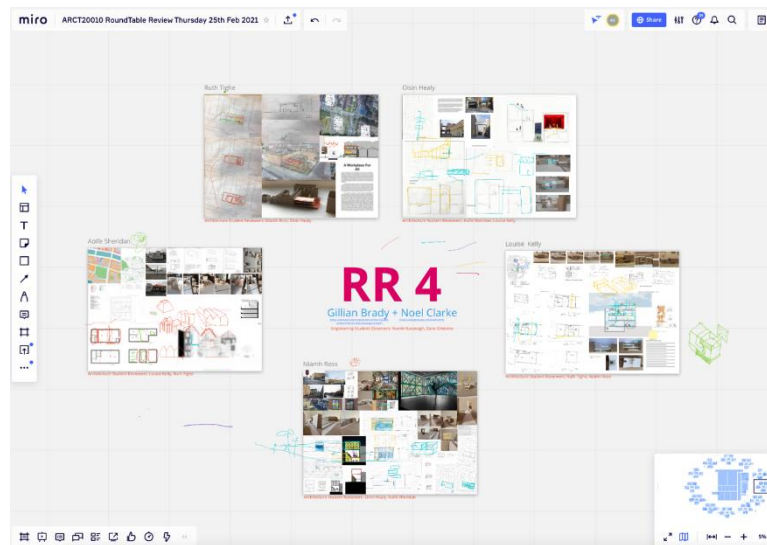
Figure 6. Roundtable Review, UCD 25-02-21: Detail of a review 'table

In our module feedback, students often complain when review comes at the end of a project - wishing they had been told of a particular point sooner. Feedback is most useful when it is timely and actionable[15]. Resources were thus recalibrated, moving more visiting reviewers to this interim Roundtable review rather than at the end of the term. This led to stronger formative feedback.

Online, it was feasible to engage a more diverse cohort of experts: people from different parts of the world and types of practice, those who might not normally be able to devote a full day to travel and review.

The online format meant it was necessary to brief reviewers on the technology, but also on the ethos of the review – building a shared community of practice for the afternoon.

Face to face we encountered spatial and budgetary constraints to the Roundtable format, despite it being very popular with staff and students. Online, due to Miro/Zoom, there was ample space, allowing room for considered presentation, discussion, and feedback, lending the afternoon a more relaxed and constructive pace than normally experienced at reviews. This allowed students to participate in and absorb the discussion more meaningfully.

In online reviews, no one sits 'at the back' as a student said at a review. The online interface delivers a levelling and arguably more inclusive aspect, internet speeds notwithstanding. Students seem less self-conscious when reviewers are looking closely at an aspect of the work and are therefore able to receive feedback in a space that they might be more comfortable.

In the spirit of the Roundtable Review, student input was structured into schedule. Students were asked to give their peers feedback before the reviewers, thus setting the tone for the discussion. This allowed each review table to then build discussion through sketched feedback over the course of the afternoon.

What we found is that online, the focus seems to shift more meaningfully to the work itself, rather than on the person being reviewed or reviewing.

From our reviewer and student feedback, one of the significant points was related to time: In the physical setting, reviewers do not have long to consider their response, and often students remark on how they cannot remember what was discussed. Online, using formats such as Miro, the proximity and availability allows for a close, more considered read, and due being asked to upload the day before the work available to view in advance. This allows the students and reviewers time to explore the work for longer and in more depth.

Similarly, the board also acts as an archive – the comments and work remain for student to refer to, thus expanding the time and space of the review and allowing for the possibility of synchronous and asynchronous feedback.
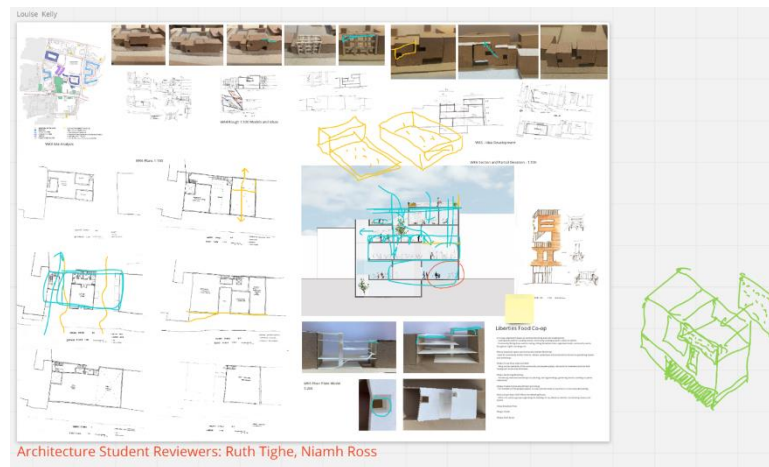
Figure 7. Roundtable Review at UCD 25-02-21: Detail of a review 'board

Guest reviewer (Laura Harty) from the University of Edinburgh adapted the Roundtable format further and combined it with another aspect of the delivery of feedback in the research project. In this adaptation each project was given autonomy with the integrity of original work retained. Everyone around the 'table' was invited take a space around to re-work the project on their own piece of (virtual) sketch paper and provide feedback. This further expansion of the format was very successful and was used for the final review format in UCD, allowing the students to absorb the feedback more meaningfully in time for their portfolio.

Drawing from these review iterations, in UCD, the format was then used to support the development of an interdisciplinary collaboration with a Structural Engineering module. Teams of student architects and engineers worked together to develop the detailed design of a student project. The Roundtable format was used very successfully for the student teams to consult with practicing engineers and architects, thus facilitating interdisciplinary student work and real-time access to interdisciplinary experts, expanding the space of the studio.

What is the feedback on our new feedback?
The Roundtable Review format enables staff and guests to become facilitators in the students' learning, rather than judges. The review format changes the learner from being passive and being judged in a crit scenario to active and participating in creating knowledge in a Roundtable setting. Through this active learning a new type of judgement comes to the fore from the student perspective. This is to use their judgement in how to work collaboratively with others and how to judge relevant knowledge. The online world gives unlimited access to information. With access to information no longer an issue the ability to judge what is relevant becomes core. This new method teaches students how to work with others to navigate this world.

The new format found favour with the staff and invited external reviewers. Of the guest Roundtable reviewers 92% expressed an interest in using this form of review in future.

WHERE NEXT – WHAT WILL REMAIN?

As educators, the move online has compelled us to develop our pedagogical design practice. It has presented a new openness to connect and collaborate with expertise in other disciplines and institutions as this example below shows – a screengrab of architecture and engineering students working together to consult with practicing engineers and architects on how to develop the structure and design of their project.
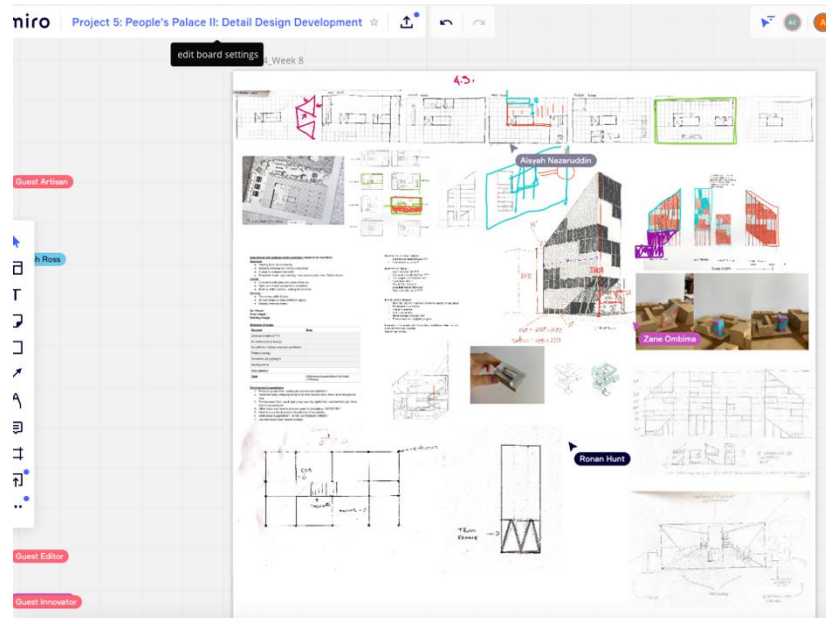
Figure 8. Engineering +Architecture Consultations at UCD 25-03-21: Consultation by a team of architecture and engineering students with a practicing engineer

The students and staff are missing the physical space of the studio - in the direct, at times transactional nature of online interaction we are noticing instances of students not developing an iterative design practice, because they are not seeing each other at work and are unable to produce work in cramped spaces at home. The physical studio offers the space and facilities to work, and we have found that we cannot replicate it online. However, it is interesting how the Roundtable format when brought online, facilitates student and staff interaction in an enhanced way that is perhaps more complex to manufacture in a face-to-face setting. The digital world offers the space and time to work with others and an equivalency that is not easily constructed face to face.

The students' world is about sharing and digital connection. A large part of architectural practice is about collaboration and communication. We propose now to marry these worlds together to expand the space of the physical studio to co-create something new. Referring to Humboldt 's[16] idea of the university being a place for people to meet and exchange ideas, when we return to the physical studio spaces, this methodology offers an extension of the physical learning environment into the online world. This may resonate more meaningfully with newer generations of students, equipping them for modern practice.
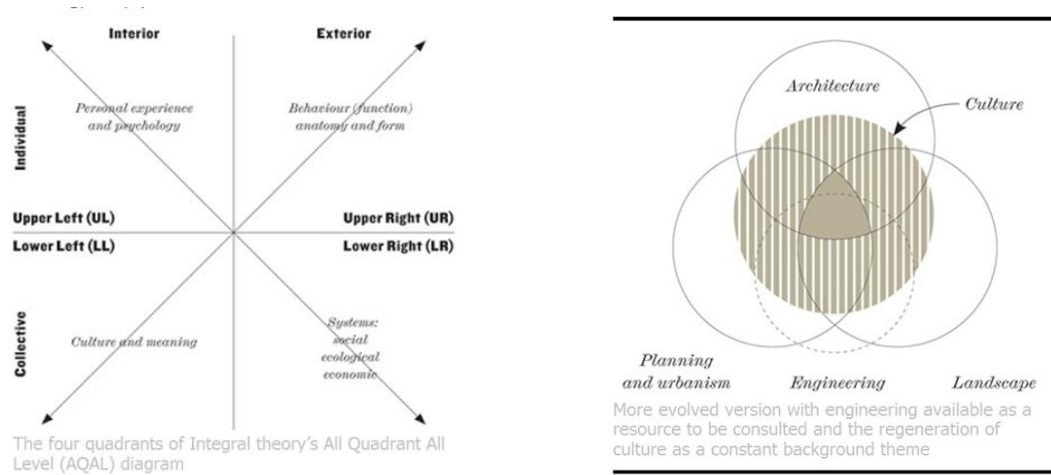
Figure 9. Buchanan (2011)

This bringing in of other voices opens the possibility for further Cross Disciplinary Research.

Hunter[17] outlines reinventing the school as an orchestrated network, one that not only includes tutors, but also a range of expert consultants and different disciplines.

This gives us the possibility of moving away from the architect as sole author towards architect as collaborator with other disciplines. This is one of the themes that Buchanan refers to in his article "The Big Rethink: On Architectural Education"[18] where he refers to the term "scenius" [19]. "Scenius" stands for the intelligence and the intuition of a whole cultural scene. It is the communal form of the concept of the genius. In this process the feedback can be used to bring about a new curriculum that is connected and more centred on the co-creation of knowledge.

This will challenge students to a deeper level of learning so that they are not 'traditional experts' but rather they are 'expert learners.'

CONCLUSION

In conclusion this ties in with Webster's[20] exploration of the importance of the culture of learning. She points out that students learn in a variety of settings: from their peers, exhibitions, talks, as well as from tutors- what Fung[21] refers to as the Connected Curriculum. In other words, we all learn together and from each other – returning to Humboldt - the role of feedback is to provide the space to allow this to happen.

This gives us an opportunity post - COVID to embrace blended learning in the studio feedback process. It allows us to replace the crit with a reimagined method of feedback without the old locus of control, one where we could explore the idea of the architecture feedback process including many voices - a true community of practice - an orchestrated network in our connected curriculum.

NOTES

[1] Reyner Banham, "A Black-Box-The Secret Profession of Architecture", *New statesman & society* 3, no. 122 (1990): 22-25.

[2] Pierre Bourdieu and Jean-Claude Passeron, "Reproduction in Education, Society and Culture, SAGE Studies in Social and Educational Change, Volume 5." (1977).

[3] Sevgi Türkkan, "The 'Anti-Architect': Phantasy or a Probability". (Paper presented and published at the proceedings of the International Conference entitled "Political Imagination and the City" in Santiago, Chile. 7-8 July 2016).

[4] Garry Stevens, *The favored circle: The social foundations of architectural distinction* (MIT press, 2002).

[5] Pierre Bourdieu, *The logic of practice* (Stanford university press, 1990), 68.

[6] Milton Cameron, "The jury's out: A critique of the design review in architectural education." *Survey: Current art and design research and practice within Australian tertiary art and design schools. Tasmania, Australian Council of University Art and Design Schools (ACUADS,* 2003).

[7] Michel Foucault, *Power/Knowledge: Selected Interviews and Other Writings 1972-1977. (*Random House USA, 1980).

[8] Christine McCarthy, "Redesigning the design crit", (Ako Aotearoa, 2011).

[9] Rosie Parnell, Rachel Sara, Charles Doidge, and Mark L. Parsons, *The crit: An architecture student's handbook* (Routledge, 2007).

[10] Kathryn H. Anthony. *Design juries on trial: The renaissance of the design studio* (Van Nostrand Reinhold, 1991).

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[12] Thomas A. Dutton, ed. *Voices in architectural education: Cultural politics and pedagogy* (New York: Bergin & Garvey, 1991).

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[16] Johan Östling, *Humboldt and the modern German university: An intellectual history* (Lund University Press, 2018).

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[18] Peter Buchanan, "The Big Rethink", *Architectural Review* (Dec. 2011).

[19] Peter Buchanan, "The Big Rethink", *Architectural Review* (Dec. 2011).

[20] Helena Webster, "Architectural education after Schön: Cracks, blurs, boundaries and beyond", *Journal for Education in the Built Environment* 3, no. 2 (2008): 63-74.

[21] Dilly Fung, *A connected curriculum for higher education* (UCL Press, 2017).

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DIGITAL LEARNING: MAKING A CASE FOR SPACE. INNOVATIVE LEARNING, ITS SOCIAL FORMS, AND ITS SPATIAL DIMENSION

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INTRODUCTION

The COVID-19 Pandemic has shifted learning from a physical-spatial practice to a virtual-spatial one. Suddenly, students and teachers moved to their homes and from there, they've adapted the learning-teaching practice using a set of digital platforms such as Zoom, MS Teams, YouTube, and even Facebook to quickly respond to the crisis.

While some may believe that the pandemic has forced our hand and helped opening new opportunities and areas for education, others believe that things will eventually return to "normal". This paper argues that digital learning at home, aka remote or distance learning, won't be the "school of the future". On the contrary, the pandemic showed us that social-spatial exchange continues to be crucial. To be in the same physical space, at the same time is what transforms a space into a place for dialogical learning. The spontaneous conversations, connecting with your peers face-to-face, the feeling of belonging, and the appropriation attached to the spaces, cannot be replicated into the learning space of a digital platform. However, going back to "the way it was" would be a waste of the opportunity and experience we gained during the pandemic. Following this, educators and students have the chance to combine the benefits of virtual learnius with face-to-face settings to form new and better learning and teaching practices.

The aim of this paper is to give an overview of the correlation between different types of spatiality and specific pedagogical approaches in order to shed a light on the spatial consequences of digital learning when added into physical learning spaces.

In the last decades, there has been a paradigm shift from teaching to learning. This transformation depends on the one hand pedagogy, and on other hand, the spatial environment. The association between architecture and pedagogy is not new; Comenius already mentioned its importance back in 1632[1]. Maria Montessori, Loris Malaguzzi and other pedagogues have also addressed space as crucial for the learning process, even stating "space as the third teacher"[2].

During our research in Real-Laboratory CITY-SPACE-EDUCATION[3] we found that the most innovative schools had a wide "learning spaces portfolio", resulting in spaces for a variety of social forms like individual work, coaching, small group, instruction in class, but also spaces for informal learning or relaxation. These are the bases for achieving the main aim of this paper: to make a case for space where digital learning can be integrated.

The evolution of learning spaces

Learning spaces tend to reflect the Zeitgeist for which they were conceived and built. In the case of Germany, traditional learning spaces, regular classrooms, were designed under the slogan "education and structure for the masses" at the end of the 19th century[4]. This entailed a teacher-centered and content-centered practice, encouraging one sided instruction for an homogenic group. Consequently, the classroom became a space focused on the teacher and the blackboard, creating the so-called frontal or ex-cathedra instruction. These spaces have been strongly criticized due to its hierarchical structure, as Robson argues: "The system of public instruction is almost as military in spirit as that which governs the army."[5] Sarah Dahlinger also addresses the military spirit of education and explains, "The teacher directed, controlled, and dominated the classroom from a raised desk set up in front of the class, and usually made no reference to the students."[6] In this sense the students had a passive role, whose task was to listen and to respond when asked a question. Unfortunately, most schools around the world operate in this type of physical environment.

Towards the end of the 19th century, reform pedagogues developed concepts for pedagogy better suited for children. Maria Montessori, Peter Petersen, Célestin Freinet, Paulo Freire, Ivan Illich among others, strove for approaches such as self-activity, the school as a space for action in a community, communication, and cooperation as criteria for the design of space. These have not lost their significance to this day. Approaches such as the Waldorf pedagogy seeking to nurture capable individuals, who create meaning for their lives, and who become freethinking and acting individuals were also influential to a new understanding of learning. As Illich said back in 1973: "Most learning is not the result of instruction. It is rather the result of unhampered participation in a meaningful setting. Most people learn best by being "with it", yet school makes them identify their personal, cognitive growth with elaborate planning and manipulation."[7]

Consequently, we advocate for the paradigm shift "from teaching to learning", going towards a student-centered learning-oriented pedagogy[8]. This appears to be vital since, in today's society, which has been becoming more complex, diversified, global, and, above all, digital for years, competences directed towards tackling complex challenges are required. These so-called future skills or 4C learning aim at key competences for the 21st century. The four C´s are: creativity, communication, critical thinking, and collaboration and it is almost impossible to implement these competences in traditional, frontally oriented spaces.

The concept of "learning spaces portfolio"

Learning is a practice that interconnects spaces and pedagogical approaches. In contrast to traditional pedagogy the new student-driven approaches address the heterogeneity of students. The learning spaces portfolio[9] is the spatial translation of this concept, recognizing that everyone is different, implies acknowledging that everyone learns in a different way and at a different pace. In the Real-Laboratory CITY-SPACE-EDUCATION[10] we were able to conduct research at multiple schools that used novel pedagogical concepts and non-traditional spatial settings.

Based on the research, we found that many ground-breaking schools had a wide "learning spaces portfolio". Some of the schools did not even have "classrooms", there were "learning ateliers", "learning landscapes", "market squares" and "coaching rooms". The corridors become learning zones, where curtains, standing desks, and sofas create, among others, "learning cells" and niches. Figure 1 shows a variety of "walkable learning zones" that have been integrated into the access areas of the school building, taking advantage of every square meter.

Figure 1. Photo-Collage "walkable learning zones"; Source: Reallabor STADT-RAUM-BILDUNG 2019

In order to define the learning space portfolio of each school we categorized the variety of learning spaces according to learning situations regarding the social setting and interaction, such as: group learning, input in a class, input for a small group or a bigger group, and coaching among others. Figure 2 shows a graphical representation of the different categories of the learning space portfolio, where "individual work", usually quiet, defines an individual learning setting from the perspective of the pupil, "coaching" a spatial setting designed for a quiet atmosphere and safe space, the "small group work", usually louder, defines spaces designed for 2-5 people groups that might be enclosed (a separate space) or temporarily enclosed (like curtains or flexible furniture). The "instruction in class" describes a space designed for inputs/presentations for a big group, the "circle of chairs" portrays a setting for exchange and discussion.
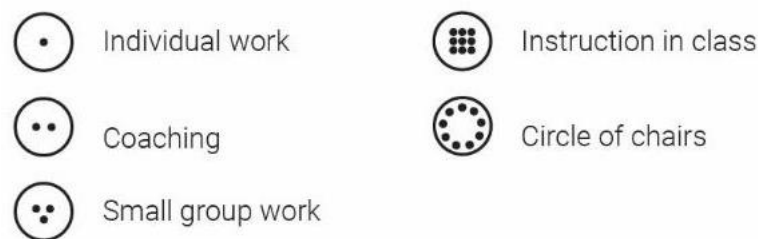
Figure 2. The "social forms of learning" diagram; Source: Reallabor STADT-RAUM-BILDUNG 2019

According to the learning spaces portfolio the social forms of a school from the 19th century will be structured as shown in Figure 3. An architecture designed for the accommodation of students into the system, a repetition of same-size cells, with clear division between genders and barriers between outside and inside, determining when, how, and where it will be learned.
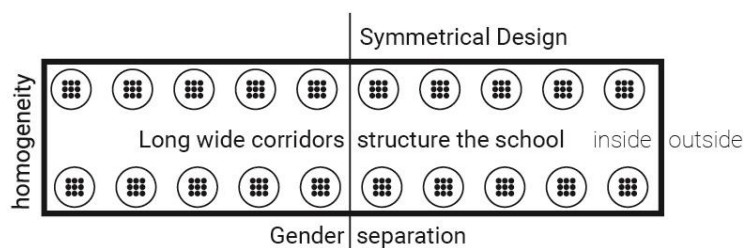
Figure 3. Old School Structure Diagram, Belen Zevallos 2021

From the analyzed schools, the Alemannenschule Wutöschingen / Germany stands out due to their extraordinary learning spaces. Its learning space portfolio was tailored to the pedagogy they have. For example, the input sessions, which pedagogically should not be longer than 20 minutes, were given in a small long room facing a whiteboard with a long table and no chairs, encouraging the students to

focus towards the board, and by this constraining the length of the input given, as no one wants to stand longer than 20 min. For discussion in class there is also a specific space with a round table and a circle of chairs. Figure 4 depicts the comparison of these two social forms and its spatial consequence; the left image represents a well-lit space with chairs arranged around a table in a circular setting, allowing all participants to see each other; in contrast, the right image shows the standing input space which focuses on the white board, encouraging students to pay attention to the instruction.

Figure 4. Photo-Collage "Discussion & input"; Source: Reallabor STADT-RAUM-BILDUNG 2019

The learning atelier (Figure 5), houses more than 100 pupils and is a double-height space with a treehouse like structure where the pupils have their individual desks. The atmosphere in this space is as quiet as at the library, kids come here to work on their individual projects. Figure 5 shows the treehouses with the individual desks and the teachers desks in the middle of the space. The pupils' desks are personalized by them.
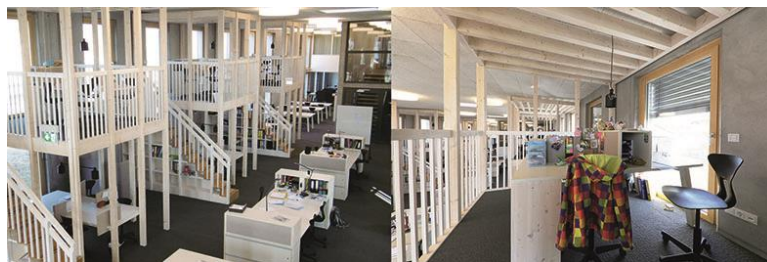
Figure 5. Photo-Collage "Learning atelier"; Source: Reallabor STADT-RAUM-BILDUNG 2019

In contrast to the "learning atelier", at the "market square" (Figure 6) the pupils can be louder and communicate with their peers; there is group work in sofas, standing tables for quick inputs or explanations, comfortable carpets and pillows to sit around, temporary "learning cells" defined by curtains, while a variety of "chilling areas" expand the range of options.

Figure 6. Photo-Collage "market square"; Source: Reallabor STADT-RAUM-BILDUNG 2019

The Alemannenschule Wutöschingen has been using digital learning tools long before Corona called for it. It relies on the differentiated and pragmatic use of digital media to assure their individualized learning strategy. With this concept, the school won the "German School Award" in 2019.

Furthermore, the school responded with a specific architecture that supports this kind of learning experience. Therefore, while some pupils are learning with videos in a group setting at the market square, others are having an input session with a teacher, and at the same time other pupils are learning individually at the learning atelier. In other words, digital learning encourages heterogeneity at school.

Here it is important to note that the learning portfolio of this school extends beyond the built limits of the school building. The school utilizes several spaces of the community as media centers, the town hall, libraries, local farms, the town´s swimming pool among other public facilities. The school´s principal defines the town as a "learning village" understanding the whole town as part of the learning process of the pupils, making the Igbo and Yoruba proverb "It takes a village to raise a child" a reality.
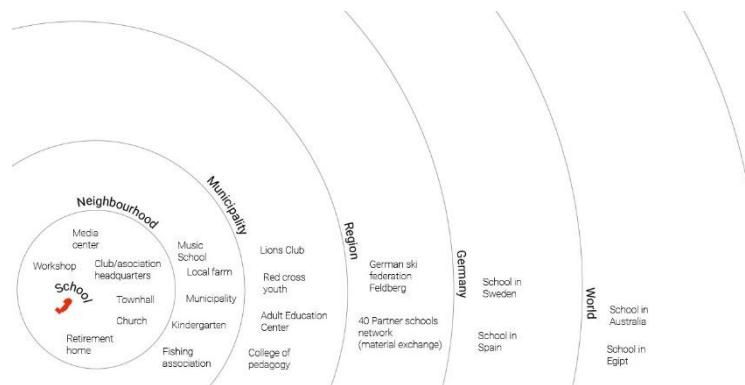
Figure 7. School as a Catalyst Map by Belen Zevallos, based on Reallabor STADT-RAUM-BILDUNG 2019

Learning at these kind of schools means you can decide what, when, and how to learn. Learning is understood as a self-paced process, determined by the learners, and discussed with the teachers in order to develop learning goals. The architecture of these spaces reflects diversity and choice, as their pedagogy. To do so, it transforms the once single instruction space of traditional classrooms into a potpourri of spaces and learning experiences engaged with the community. We see spaces that invite us to communicate and interact, spaces that embody Illich and Freire's ideas.

Digital learning, the decentralization of learning and its spatial potential for opening up the school

The digital revolution changed the way we learn by dispersing information through space and time. In this regard, we cannot deny that one of the main advantages of digital learning is the decentralization of learning. Similarly as at the Alemannenschule Wutöschingen, the Ernst-Reuter-School in Karlsruhe uses digital tools to support the individualization and personalization of their pedagogical curriculum. As the first "Smart School" of Baden-Württemberg, the Ernst-Reuter-School incorporates technology and digital learning into every course. They realized that digitalization was not just helping but changing the way people learn. At this school, there are makerspaces (see Figure 9), virtual reality, and augmented reality spaces. Nonetheless being outside in the urban gardening project, reading at the

"outdoor classroom", meeting at the "no tech zone", helping out at the student-run café, advising the community's elderly at the student-run social office or doing an internship in the city are all important for their learning process.

Figure 9. MakerSpace at the Ernst-Reuter-School; Source: Hohenloher

In the majority of innovative schools we visited, the surrounding neighborhood and the city plays an essential role in the school community. Thanks to digital tools the school breaks its physical barriers and expands throughout the virtual and global world. Consequently, the learning space portfolio goes beyond the school walls, to the library, to the square or park, to public spaces in general. At the same time the community perceives the school as a public space for and within the community. Often the schools were perceived as community hubs where: the large school cafeterias were used for community events; some classrooms held night classes for refugees; on the weekends there are yoga classes for the neighborhood; in addition to community libraries being designed increasingly as part of schools.

Apps, software, and artificial intelligence (AI) can help us to identify patterns and to recognize our mistakes as well as to assist us in learning a specific topic or skill. However, we argue that digital learning will not replace schools. Schools will continue to be places of encounter, exchange, as well as a provider of basic learning infrastructure. If anything, the pandemic showed us the socioeconomic gap of several families in many levels and the lack of access to digital hardware and a stable internet connection was one of them.

Be it hybrid models, blended learning or flipped classroom strategies, people are bound to space. Even when learning remotely in a virtual class we are in a physical space. Moreover, to be in the same physical space at the same time is what transforms a space into a place for dialogical learning that cannot be replicated into the learning space of a digital platform. The social-spatial exchange continues to be crucial.

Let us bear in mind Mikhail Bakhtin's Dialogical Principle[11], which reminds us that there is no "I" without the "other". We thus affirm that the dialogical principle requires the coexistence of learners in the same physical space, especially in project-based courses where creativity and critical spatial practice[12] is fundamental. In these, it is also crucial to put hands into the matter[13], which means uniting making and thinking as a connected practice; we need spaces with messy floors, where the experimentation and the process of creation unfolds. This can only happen in a collective atmosphere. Without this, learning becomes a flatland[14].

In this context, digital learning is an important step in the process of dismantling schools' monotonous classroom structures and opening up the school to the community, allowing them to become more like "Learning webs"[15], as part of a citywide network of public spaces and infrastructure dedicated to lifelong learning.

CONCLUSION: TOWARDS THE "SCHOOL OF THE FUTURE"

The pandemic showed us the potential and the limits of digital learning. While technology can very well serve many roles in education, such as instruction, repetition, practice, and even feedback, as stated in this paper, schools won't disappear, and distance learning won't be the school of the future.

Nowadays, thanks to new pedagogical approaches, we understand that, depending on the pupil, situation or even topic, children learn in a variety of ways; individually, in pairs, in small groups, in virtual groups, and even in very large groups (like in global virtual communities).

As mentioned before, technology can take over many teaching functions, but schools exist to serve multiple purposes, such as teaching kids useful skills for their lives and for society, like social interaction, empathy, tolerance, compassion, as well as, encouraging social cohesion. However, the classrooms might be the ones to disappear. This has been also discussed by Marc Prensky[16] who once said "not to eliminate schools, but rather to eliminate the classrooms (…)" While traditional classrooms may have served a useful role in times when individualization and personalization were not as important, nowadays, the classroom, as the heart of the learning experience, has become obsolete.

As described in this paper, digital learning takes place in both virtual and physical environments. In this context, traditional learning institutions, such as schools and universities, must respond to digitalization with a holistic approach. This includes not only a stable internet connection, tablets, and additional plugs, but also, as shown in this paper, specific spatial settings.

Moreover, the physical space can not only be expanded by the digital space, but also transformed by the means of augmented and virtual reality. The latter has an incredible potential for teaching and unique learning experiences. As a consequence, the social forms from Figure 2 are expanded (see Figure 8): with video call where all participants are connected individually to a virtual room, video conference in audimax where several students in an auditorium attend a virtual session, hybrid settings where physical and remote attendees share the same instruction at the same time, virtual reality where a digital world is explored by the use of goggles and controller, and finally augmented reality where digital models are projected into a physical space.
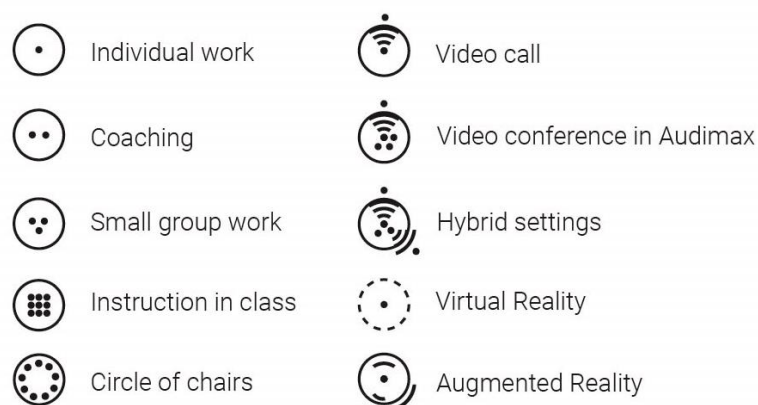
Figure 8. The "new social forms of learning" diagram based on Reallabor STADT-RAUM-BILDUNG 2019

Without doubt, digital learning plays a crucial role in supporting the pedagogical diversification, decentralization, and individualization of learning. Therefore, we make a case for space. Redefining education requires redefining the spaces in which it takes place, wherever they are located, inside or outside the school walls. We still must wait before seeing virtual reality classrooms in every school, but we think that the transformation of traditional classrooms and access areas into diverse learning zones, setting up temporary outdoor classrooms at a public space and involving the community is not that far away. However, there is still much to be discovered and communicated: the relevance of space must be conscious to every stakeholder in the process of planning future learning spaces. We see the future of learning spaces in the meaningful intersection of physical and digital spaces.

NOTES

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THE POST-PANDEMIC POTENTIAL OF A LIMITLESS LEARNING MODEL: USING TECHNOLOGY TO BROADEN ACCESS TO EDUCATION AND EXPERIMENT WITH PERSONALIZED LEARNING

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INTRODUCTION

The Covid-19 pandemic accelerated digital transformation in all areas including higher education (HE), an industry with the reputation of being notoriously resistant to change.[1] Although online education has existed for several years, before the pandemic it was largely asynchronous and ran on a track parallel to in-class education. Full-length online courses were mostly targeted at mature or graduate students, and shorter, free courses offered through platforms like Coursera suffered from limited legitimacy perceptions and notoriously poor completion rates.[2] Covid disrupted this trajectory and forced mainstream, in-class HE classrooms to move online for the first time ever, leading to a period of experimentation and transformation that some argue is long overdue.[3] At Hult International Business School, as in so many other educational institutions, this initial phase was a steep learning curve for students, faculty and administrators alike and was marked by hurriedly arranged online Zoom training sessions and intense experimentation with a variety of digital tools such as Miro and Mentimeter. . The end of the national lockdown in the UK, however, did not signal a return to business as usual for Hult. September heralded the beginning of a new phase, one marked by the variability of the so-called 'hybrid' or 'blended' classroom. Some students returned to campus, and some continued their education online from the safety of their own bedrooms; some faculty returned to the classroom while their more 'vulnerable' colleagues had to teach students online and in class from home. Some countries, regions and cities experienced a relaxation of Covid restrictions just as others tightened theirs up, quarantine rules changed weekly, and our international student body was inevitably caught up in this quagmire of changing rules and restrictions. This paper argues that hybrid learning models such as Hult's limitless learning (LL) initiative can be an effective solution to this kind of situation and explores the extent to which these models could be used in a post-pandemic world to broaden access to HE and to deliver a more interactive and personalised learning experience than has generally been thought possible with online platforms.

Limitless Learning and Active Learning

Limitless or hybrid learning uses digital tools and platforms in conjunction with tracking cameras and microphones to enable off-campus students to join 'hybrid' classrooms and interact and collaborate

with their onsite professors and peers in real time via a system of screens, microphones, Zoom and a good Wi-Fi connection. It is designed to be flexible, interactive, and multimodal, and aims to reduce as far as possible the isolation and dislocation that can be experienced by online students by allowing the use of synchronous as well as asynchronous modes of learning. Professors organise and manage learning strategies that work well in both online and in-class contexts, and that keep both at-home and in-class students motivated and engaged. LL can incorporate flipped learning (FL) and active blended learning (ABL) strategies and techniques, both of which are actively favoured and promoted at Hult. FL is a student-centered pedagogy that gained popularity after 2012. It involves 'flipping' the classroom by posting lectures online and freeing up classroom time for hands-on learning activities that encourage students to apply what they have learnt in concrete ways that consolidate their learning.[4] ABL has been identified in recent years as a pedagogy that shows promise in increasing student engagement and learning in higher education.[5] Unlike the stricter interpretations of FL, ABL encourages the judicious use of face-to-face teaching to supplement 'flipped' instructional material.[6] ABL aims to blend different learning experiences to provide a more personalised learning environment that leans heavily on the creative use of digital tools and solutions to help students thrive. In ordinary times, these active learning pedagogies work well at Hult. Professors post a large proportion of class content online on our LMS system, thereby freeing up time in the classroom for learning activities and assessment types that encourage collaboration and the application of learned content to new contexts. When Covid struck, this familiarity with a good LMS system proved an advantage for Hult in many ways. In some important respects, however, the shift to online and then to hybrid classes proved deeply problematic for the school[7]. The social interaction and 'buzz' that happen in the FL/ABL classroom are crucial intrinsic motivating factors, and nothing in the literature could therefore have prepared faculty for a situation where the in-class learning activities and social interaction that lie so proudly at the heart of FL and ABL had to suddenly be adapted to an online environment[8]. Pressing questions about which strategies and activities could best survive this abrupt transfer to the virtual world, and to what extent the pedagogies could successfully be applied to a context they were not designed for, remained perforce unanswered.

This paper seeks to provide early answers to some of these questions. Our experience over the past year and a half has shown us that LL has some advantages over traditional classroom settings. It can broaden access to HE and allow students from diverse backgrounds, income brackets and cultures to access live classrooms and to continue learning and interacting with professors and peers regardless of pandemics, civil unrest and other personal and societal problems. Learning and engagement is possible with online and blended learning, and a minority of students indeed prefer it. The valuable lessons learnt during the delivery of online and hybrid classes could be applied to a post-pandemic model of HE as long as certain criteria are met. We reflect on the importance of creating a "critical digital pedagogy" that considers not only the efficacy of digital tools and platforms but the kinds of relationships that can be built between teachers and students in online and hybrid settings and the importance of these relationships for the learning process.[9] We do this by exploring two years' worth of qualitative and quantitative data from Hult International Business School, tracking UG student learning outcomes and satisfaction levels as learning shifted from in-class to online to hybrid to online again and back to hybrid as Covid infection levels rose and dipped in the UK and US. The data comes from focus groups, self-reflections, course evaluations, and course outputs and aims to explore how well active learning teaching strategies were able to function across these shifting classroom environments. The findings from this research will be useful in the post-pandemic era, as institutions, educators and students alike seek to consolidate and adapt those elements of online and hybrid learning that worked for them during the pandemic.

METHODOLOGY

A mixed-methods approach was adopted to ascertain both qualitative and quantitative metrics of the impact of ABL and FL pedagogical methods across F2F, fully online, and hybrid learning settings on students' satisfaction with their learning experience and subsequent attainment. Initial quantitative analyses were performed as part of this pilot study to better inform hypotheses in later works.

Sample

All fall and spring semester undergraduate courses at Hult International Business School across two academic years were included in the analysis, comprising a total of 773 courses with 6224 students. Fall 2019 saw ABL and FL pedagogies employed in a fully face-to-face model. In Spring 2020, the start of the pandemic led to pedagogies being delivered face-to-face in the first half of term, before going fully online for the second half of term. A hybrid model, with some students online and some in-person, was deployed in Fall 2020, with students experiencing a mixture of hybrid and fully online delivery in Spring 2021 due to the reoccurrence of lockdown restrictions. Full descriptive statistics for the four terms included are found in table 1.

For the qualitative measures, focus groups were conducted amongst a select group of 14 students from three classes that ran in Spring 2021. The students were between 18 and 23 years old and were comprised of 5 males and 9 females. 2 students with dyslexia and ADHD were included in the sample. All students were asked to reflect on how the digital tools and technologies used in online and hybrid classes facilitated and/or got in the way of their learning. In order to assess how their emotional state impacted on their learning and engagement, students were asked to self-report on their mental health during the pandemic.

Quantitative measures

Student satisfaction

To assess student satisfaction with the ABL and FL methodologies used in courses in the different styles of delivery across the four terms, Likert scores on a scale of 1-5 were collected in end of term course evaluations assessing whether student's perception of their instructor and their course were positive overall. Descriptive statistics for these Likert scores are found in table 1.

As faculty and course evaluation scores were not normally distributed, a Kruskal-Wallis H test was performed using SPSS on the faculty and course evaluation scores to assess whether the difference in means between the four terms were statistically significant. Results of the Kruskal-Wallis H test are reported in tables 2 and 3.

Student attainment

To assess student attainment, average term GPA scores were collected across the four terms. Due to data privacy concerns, no analysis was conducted at a course level due to identifiable characteristics of each course and student being present in data. As this was a preliminary pilot study, term-level descriptive statistics are included in table 1. Future work will anonymise data points to allow for a fuller statistical analysis to be conducted.

RESULTS

Quantitative

Descriptive Statistics

Term		Faculty Evaluation	Course Evaluation	GPA*
Fall 2019	Mean	4.1830	4.0352	2.71
	N	193	193	1610
	Std. Deviation	.52539	.50068	-
Spring 2020	Mean	4.2750	4.1126	2.90
	N	181	181	1563
	Std. Deviation	.39071	.36280	-
Fall 2020	Mean	4.3079	4.1709	2.81
	N	200	200	1573
	Std. Deviation	.45145	.42496	-
Spring 2021	Mean	4.4051	4.2393	2.83
	N	199	199	1473
	Std. Deviation	.41023	.38920	-
Total	Mean	4.2940	4.1410	2.81
	N	773	773	6224
	Std. Deviation	.45424	.42913	-

Table 1. Descriptive statistics for each term and Likert score of faculty and course evaluation.
*GPA is also included, but due to confidentiality concerns, raw data was not provided for full statistical analysis in this initial pilot.

Ranks

	Term	N	Mean Rank
Faculty Evaluation	Fall 2019	193	344.98
	Spring 2020	181	362.19
	Fall 2020	200	392.68
	Spring 2021	199	444.62
	Total	773	
Course Evaluation	Fall 2019	193	340.48
	Spring 2020	181	363.88
	Fall 2020	200	401.11
	Spring 2020	199	438.97
	Total	773	

Table 2. Mean ranks for each term after a Kruskal-Willis H test

Test Statistics[a,b]

	Faculty Evaluation	Course Evaluation
Kruskal-Wallis H	22.455	21.900
df	3	3
Asymp. Sig.	.000***	.000***

a. Kruskal Wallis Test
b. Grouping Variable: Term
*** $p = < 0.001$

Table 3. Test statistics for faculty and course evaluations after a Kruskal-Wallis H test.

Qualitative

When we asked students to reflect on the extent to which technology has facilitated and/or improved their experience of learning in online and hybrid classrooms over the pandemic, we expected them to compare digital tools and platforms such as the merits of using Miro versus Mentimeter, or Teams over Zoom. We did get lots of useful information in this regard. For example, we learnt that the anonymity of Mentimeter negatively impacts their motivation to participate in polls and quizzes, that our students crave gamification, and that Zoom breakout rooms are often unsuccessful at fostering meaningful discussions and collaborations unless activities are carefully structured and clear active deliverables are required. Some students spoke of the difficulty they experienced with poor Wi-Fi connections and the lack of dedicated study spaces back home and stressed that it is more difficult to feel motivated and part of a learning community when seated behind a screen. One student pointed out that LMS systems do not operate equally well on all devices, saying that she was unable to gain full functionality on her iPad.

The data we collected made uncomfortable reading at times. Many students, especially female students, spoke of their discomfort at being fully visible on Zoom, with some explaining that their unease was magnified when they were targeted with unwelcome comments on their appearance and sent screenshots of their faces taken in class sessions, often while the class was still underway, which heightened their sense of inhabiting a panopticon rather than a classroom. One student highlighted the impact of this virtual panopticon by saying "if we were in a real classroom, nobody would walk in the middle of class and disrupt my learning experience to go like, 'Hey, you're cute'… I don't like the idea that other students can have my face like constantly on their screen". On the positive side, the two students with dyslexia and ADHD credited technology for improving their focus and reducing distracting stimuli and the introverts in the focus groups said they felt more comfortable participating on Zoom, as they were less aware of the other students in the class and felt like they were addressing the teacher directly which raised their confidence.

Overall, however, there was less talk of the merits and downsides of individual digital tools and strategies than we expected. Students spoke instead of the importance of cultivating personal relationships with teachers and other students, and rather unexpectedly the old-school in-class discussion was seen as more effective in this regard than new tools such as Miro. Students reported a lack of connection with professors and other students online compared to F2F delivery, with one student saying "[the professor] underestimated the importance of creating relationship, even if you're online, like creating opportunities and situation to get to know each other before jumping in straight away to the course material and the contents" and another stating that "one of the challenges with zoom is you don't get a lot of those interactions that you have during a class teaching experience, those social interactions and building that social camaraderie in a classroom is really essential for engagement, motivation, and just enjoying the class." Professors who made extra efforts to provide time for formal and informal conversation and interaction with their students, for example by laying on extra office hours or by hanging around on Zoom after class had officially ended, were singled out for extra praise here for managing to make online and hybrid learning seem "less transactional" and more human.

We collected some poignant reflections too, chief amongst them the observation that finding themselves back in their childhood bedroom instead of living new lives as independent students in London was hard on their sense of self. "I feel that I haven't grown, you know I don't feel more independent or anything like that … I don't think I made any new friends" said one student, while another agreed and added that synchronous online and hybrid classes were a godsend as they were "the only thing that keeps you still feeling like part of a community … I could not imagine what it

would be like being locked down without any classes, without any sort of sense of belonging." Technology and digital tools were simultaneously seen as reminders of and mitigators of the disruption, broken dreams and isolation caused by the pandemic.[10]

CONCLUSION

These initial findings suggest that it is possible to use ABL and FL effectively in online and hybrid settings where learning has a strong synchronous component. One limitation of these findings is the lack of inclusion of asynchronous core content delivery, as many institutions have implemented in response to the pandemic. The quantitative data shows that although student attainment dipped slightly in hybrid settings, student attainment was not negatively impacted in online and hybrid classrooms that use ABL and FL. More detailed analysis is needed here, to assess student attainment at an individual level and with more rigorous statistical analysis in line with the analysis conducted on faculty and course evaluations, and future work will explore this in more depth.

Effective teaching in the FL/ABL classroom - whether fully online, hybrid, or indeed in-class - is linked to the cultivation of strong interpersonal relationships and collective identity building, accountability and feedback, presence and felt responsibility, and carefully planned learning activities. Future research will explore this notion in more detail. However, there is a need for future research to investigate the discrepancy between the reported qualitative experience of students, and the quantitative metrics of student satisfaction. Overall, the sentiment of the student focus group participants painted a generally negative picture of the online learning experience, whilst quantitative analysis of student course evaluations showed a statistically significant improvement in student satisfaction across all online and hybrid modes of teaching. One possible explanation for this is that the negative feelings students in focus groups presented towards online learning were directed more towards the general malaise of the pandemic rather than the institution, courses, and individual faculty members[11]. This could also explain the statistically significant difference between student ratings of satisfaction with courses and instructors in favour of the evaluation of instructors.

This may have implications for the usage of technology to deliver FL and ABL pedagogies in a post-pandemic learning environment. Whilst students may have tolerated, and even enjoyed, FL and ABL pedagogies being delivered in a virtual and hybrid environment when this environment is imposed through government mandates and restrictions necessitated by the pandemic, student perceptions of these pedagogies may differ if the decision to move teaching from F2F to virtual/hybrid modes is made at an institutional level.

NOTES

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SUPPORTING INTERDISCIPLINARY COLLABORATION THROUGH MINDFULNESS AND CONTEMPLATIVE ENGAGEMENT

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INTRODUCTION

Interdisciplinary collaboration is essential to develop big picture solutions to thorny problems including in the fields or architecture and built environment[1]. However, scholars have discussed challenges such as diverse bases of knowledge[2], disciplinary egocentricism[3], and lack of interdisciplinary training in colleges and universities[4]. In this paper, we contribute to this discourse by proposing the use of mindfulness training to increase cross-boundary, cross-disciplinary exploration, and collaboration and decrease disciplinary egocentric behavior.

Mindfulness, a spiritual practice developed in eastern civilizations for over two millennia, has been adopted in various disciplines ranging from clinical and counseling psychology[5], social and personality psychology neuroscience[6], medicine[7], education[8], to leadership development[9]. We describe an interdisciplinary course on mindfulness and contemplative engagement that we developed and taught to students from various disciplines. We present a preliminary theoretical framework of how mindfulness can help transcend disciplinary egocentricism to facilitate interdisciplinary learning. We vivify the framework with examples from journals of students who participated in the class.

MINDFULNESS TRAINING FOR INTERDISCIPLINARY LEARNING

Interdisciplinary Learning (IL) requires the capacity *"to integrate knowledge and modes of thinking drawn from two or more disciplines to produce a cognitive advancement in ways that would have been unlikely through single disciplinary means"*[10]. Disciplinary egocentrism[11] accompanied by reduced cognitive complexity[12] fits the world to a disciplinary peephole becoming a barrier to IL. Most educators focus on team skills to combat it[13] leading to a profusion of team projects in higher education contexts. However, such teamwork mostly manifests as division of labour[14], limiting integration across disciplines[15]. Disciplinary egocentrism is an attitude and mindset that cannot be solved by teaching teamwork alone. To move beyond disciplinary egocentrism, a shift to a broader learner-identity is essential[16].

We examined if mindfulness and contemplative practices training can help participants develop some capacity for IL. Mindfulness has a positive impact on prosocial orientation and prosocial behaviors[17] and can help move people beyond personal and disciplinary egocentricism[18]. Grounded in our personal practice and experience of implementing mindfulness in design and management disciplines,

we jointly developed and taught an interdisciplinary course on Mindfulness and Contemplative Engagement. New knowledge in neuroplasticity[19] demonstrates that the human brain is capable of learning new skills, making new connections with practice and at any age. To make our tacit knowledge[20] explicit[21], we share our course design and our experience regarding teaching mindfulness to an interdisciplinary audience using different disciplines as sites of implementation.

CLASS DESIGN AND RESEARCH METHOD

The Mindfulness and Contemplative Engagement elective course was co-taught by a professor of management and a professor of interior design as an online, seven-week, half-semester intensive divided into weekly thematic modules. Each co-instructor led a module related to their expertise on alternating weeks. These modules introduce students to mindfulness and contemplative practice through the lenses of social justice, place attachment and awe, nature, creativity, leadership, and design thinking. A two-day retreat complemented the modules. Originally designed to be held in person, the retreat was shifted online due to the COVID-19 pandemic and brought together students synchronously via Zoom for two half-day sessions (see Figures 1 and 2 below).

Schedule Overview

—

*all times EDT

Friday:

12:00 pm - 1:40 pm > Setting the Tone + Creating Community

1:40 pm - 2:00 pm > Break + Journaling

2:00 pm - 4:00 pm > Somatic Mindfulness with Kimberly Tate

Figure 1. Retreat Schedule, Day 1.

Schedule Overview

—

*all times EDT

Saturday:

10:00 am - 11:45 am > Interpersonal Mindfulness with Cotter

11:45 am - 12:15 pm > Break + Journaling

12:15 pm - 2:00 pm > Identity Work with Latha, Reflections, and Farewell
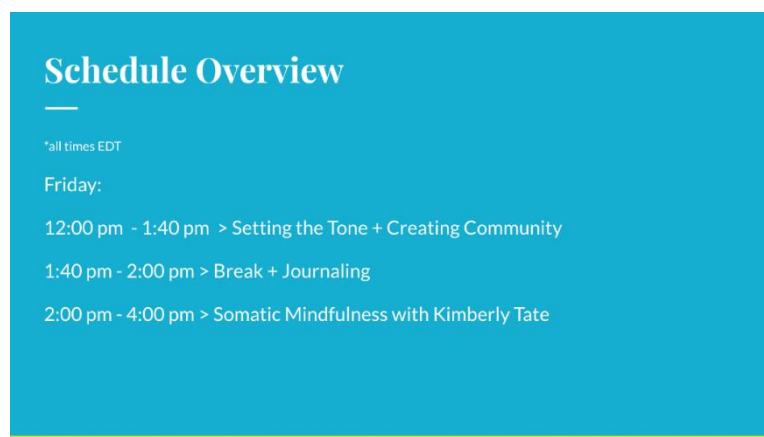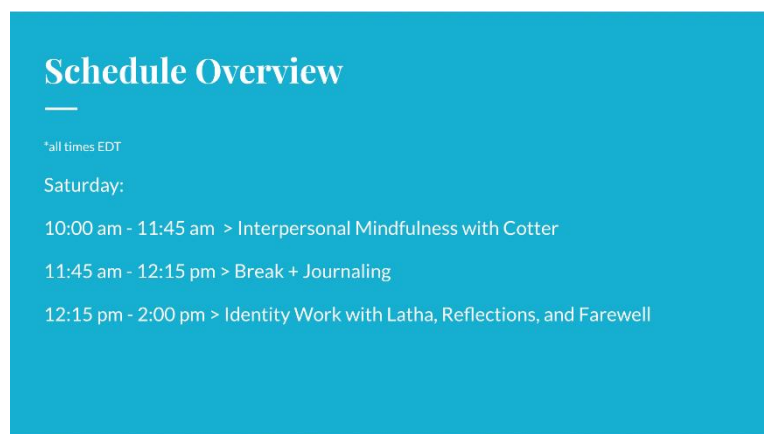
Figure 2. Retreat Schedule, Day 2.

Except for the synchronous retreat, office hours, and two optional meetups, most of the semi self-paced content was delivered asynchronously on the Canvas LMS. Each week maintained a predictable structure with a written overview, pre-recorded intro video, readings, and short recorded lectures

related to the topic (See Figure 3). Students were assigned at least one unique contemplative practice each week, typically led by an instructor recorded audio instructions, such as a body scan, awe walk, and open awareness meditation, among others. Two weekly online discussions provided an opportunity to students process and respond to the readings, lectures, and their experience with the week's required practices in community. These discussion posts also required that students engage with one another through comments and questions. Finally, each week students were asked to complete a reflective journal entry, shared only with the instructors, offering an opportunity to reflect on their experience that week and how they found the theme and practices relevant to their personal, professional, and scholarly lives. These journals provide lasting insights into the class's impact and how the students incorporated the practices into their lives outside the class. At the end of the class, the students submitted a cumulative journal entry, allowing them to reflect and notice any changes they may have experienced throughout the class (see Figure 4).

Figure 3. Sample Canvas LMS Module.

Figure 4. Cumulative Journal Assignment.

Our goal was to develop an inductive and grounded understanding of how students respond to interdisciplinary learning using mindfulness pedagogy. To capture the nuances and richness of personal experiences of the students, we adopted a qualitative methodology (Creswell, 2007) and analyzed the student journal data to explore the interdisciplinary impact in terms of key learnings.

Participants

A total of 21 students took the class. Students hailed from backgrounds including management, psychology, music, fashion, and design. Given the diversity of disciplinary backgrounds and academic standing (UG to Master's to Ph.D. students), this sample provides a naturally occurring exemplar for interdisciplinary work. More details are provided in Table 1 below.

Discipline/Number	Academic Level/Number
Design and Adjacent (8)	UG (5) Master's (3)
Psychology and Adjacent (6)	UG (1); Master's (1); Ph.D. (4)
Liberal Arts (3)	UG (3)
Global Studies (1)	UG (1)
Media Studies (3)	UG (1); Master's (2)
Voice (1)	UG (1)
Total: 21 **Design Students: 9** **Non-Design Students: 12**	**UG (12); Master's (6); Ph.D. (4)**

Table 1. Sample/Study Participants.

Data collection and analysis

Each student submitted six journals (total of 250 pages) and we used this qualitative data along with a cursory analysis of their online weekly discussions. We analysed the data using grounded theory principles and read through the data as a whole and identified passages that illuminated moments of interdisciplinary learning for us to develop a preliminary understanding of how mindfulness can be deployed for facilitating interdisciplinary collaboration and teaching interdisciplinary collaboration skills in the context of educational institutions. We correlated instances when creativity and design-based exercises were more appealing to students from outside of design disciplines and vice versa.

DISCUSSION AND PRELIMINARY FRAMEWORK

Based on our analysis, we describe a preliminary framework for interdisciplinary collaboration using mindfulness and contemplative practice as expressed in the broad thematic categories below.

Mastery and Disciplinary Identity Development

We propose that an easy way to implement mindfulness in interdisciplinary learning and collaboration is counter-intuitively through one's own discipline. Deepening and opening possibilities to be more mindful and apply contemplative practice to one's discipline can help develop mastery through diligence and a clear disciplinary identity. Understanding how mindfulness and contemplative practices relate to one's field provides a common point of departure for the acknowledgement of the intersections of these practices across disciplines. In other words, a student studying design may identify with practices related to this field, but when they see how closely those practices relate to similar non-design fields, an interdisciplinary bridge is forged. For example, the two instructors/PIs in this study each led modules that applied to their areas of expertise. Poonamallee's modules on leadership, social justice, and relationship with the natural environment pertained to her expertise in organizational behaviour, management, and social justice; and they were based on work done by her for decades. Similarly, Christian's modules on creativity, place attachment, and design drew on his expertise as a designer and creative practitioner. The recognition of the value of mindfulness and contemplative engagement to one's discipline is also reflected in student experience, as can be seen in the representative quotes below.

"Being a relational therapist will also enable me to try some exercises with my patients in the room, where we can collaborate on incorporating practices that focus on social and interpersonal bonds." AND "as an activist, I can see how some mindfulness exercises can be shared and made a part of collective activities like protesting and community meetings. The ability to offer tools to support, listen, and be compassionate with a marginalized community can have rippling effects on a movement." -- PhD Student in Clinical Psychology recognizing how mindfulness techniques can be used to support ongoing work as a clinician and activist.

"I have been looking for ways to introduce my masters work into my professional life and this was the ticket. Time management and finding ways to work on mindfulness are difficult to connect so if I can practice at work, school and home I will be in the best place. I will certainly be influenced by more nature, more empathy, and more honor of the people and cultures around me. But the strongest take-away from this class is going to be using the mindfulness tools in my professional life." -- A reflection by a Graduate Student in Media Studies on the opportunity to incorporate mindfulness into their professional practice.

"[A] similar situation applies to my design work. I always cared about the guidelines, requirements about assignments instead of thinking of the design that I really want to do. I was blocked, not saying they are meaningless, but now, I am more open in my design process. Think[ing] outside of the box and design[ing] what my heart really desires under circumstances." -- Graduate Design Student on how mindfulness and contemplative engagement has inspired new ways for them to consider their design process.

"I can see the idea of mindfulness as an aid for emotional regulation during the process of taking feedback from various stakeholders. Mindfulness could help designers [remain] open and responsive rather than defensive. Good thought!" -- A Graduate student in Design reflecting on a class discussion post about the benefit of mindfulness in the feedback process.

"I can see strong similarities with the module we had before, that was about creativity and mindfulness. I think mindfulness and contemplative engagement is key in design practice. I noticed a shift in my own thinking and perception in design practice over this year especially. I met a lot of people this year, who work in a design field and its really intriguing, that those who practice meditation and who are working on self and social awareness on [a] daily basis, usually are the ones who incorporate environmental issues in their design practice. With mindfulness you develop

empathy and compassion, that is automatically reflected in design, where you have empathy for [the] environment around you and Mother Earth and you cannot design in a different way anymore. Design becomes a part of [the] solution, rather than just self expression." Reflection from a Graduate Design Student who combines previous modules and themes on creativity, nature, and environmental justice in their response.

"I think this emphasis that mindfulness often places on individual exploration to then build an understanding of collective identity and become a part of something larger is something that I will use to stay connected to mindfulness. Especially because I hope to continue pursuing create and community education based pursuits in the fields of environmental and land based justice, which I think mindfulness will fruitfully feed into. It will help me stay connected to myself and others, build upon radical empathy needed to stand with struggles, and come up with new and creative ways to design different societal structures and futures." -- an Undergraduate Liberal Arts student recognizing opportunities to embed mindful practices into their environmental justice work.

Transcending Disciplinary Egocentricism

We find that mindfulness practice can become a tool to open learners to other disciplinary viewpoints and exercises, thus helping transcend disciplinary egocentricism. The eighteen month-long collaboration between the authors also illustrates how each of us learned a bit more about each other's discipline, creative practice, and pedagogy. For instance, Poonamallee learned about the role of critique in teaching design studio and how Christian uses mindfulness and contemplative approaches in teaching design and creativity. Similarly, Christian learned about how mindfulness can facilitate identity exploration in the context of leadership and social justice while holding a safe space for such exploration. These interdisciplinary connections were raised throughout the class by the instructors, most explicitly in the weekly introduction videos where connections between modules were reinforced. Below are a few representative quotes revealing student learning experiences about mindfulness in areas not related to their primary discipline or major.

"My initial thought after watching the first video was being in a mindful state to come up with better designs. However, after reading a few comments from the board, I realized how empathy and thinking of others is such an important part of it all." -- Undergraduate Psychology Student reflecting on the value of empathy, a theme raised in a design-based module.

"Thinking of design as a problem-solving process seems reductive, similarly to many other perceptual processes that have developed over the last few decades in the western world. It made me think of how therapy, in many places, has been reduced from the practice of developing curiosity about our psyche over time and learning to know ourselves, to short-term, symptom-focused problem-solving techniques. Taking a mindful stance, letting go of the pressure to quickly achieve goals and reduce costs- but just being present, observant, and thoughtful, allows a view that is broader than just the specific problems that are easily identifiable. Instead, it creates the opportunity to hold a complex view of reality, the self, and others. This can lead to an approach that brings progress through observing and challenging current ways of thinking, instead of focusing on specific problems in a way that limits our view." - PhD student in Clinical Psychology reflecting on themes raised in a design module to reintegrate and explore in therapy practice.

"There were also consistent themes of understanding the interconnectedness of all living beings. This arose in the lectures and readings surrounding social and especially environmental justice. I felt that there were two pathways here: mindfulness as a tool to avoid burnout and mindfulness to expand compassion for others. Compassion is really a key word for me that made many appearances in my discussion posts and journal entries." -- Undergraduate Fashion Design Student recognizing the

benefits of compassion highlighted during the social and environmental justice modules, making connections to their design practice.

"Bringing mindfulness to our behavior and our creative process is particularly important because often how we manage to address situations strengthens the already unjust and oppressive systematic oppression. Here I take the design process, as coming up with ways in which addressing [sic] oppression. Mindfulness helps us go beyond the duality of problem/solution and helps us a way to [sic] reconsider the system - and design new ways." -- PhD Student in Clinical Psychology responding to a discussion post topic during a design module.

"I really enjoyed the final week's topic of mindfulness in design and would love to bring this into projects that I am organizing. Currently I am planning on creating a space for BIPOC in diaspora, and a research project on Indigenous-led environmental justice movements in Alaska. I am excited to bring what I have learned in this class to the people helping me organize these projects and to incorporate mindfulness into them." A Global Studies Undergraduate student reflecting on the opportunities afforded by contemplative design practice for their community-based environmental justice work.

CONCLUSION

This course is a concrete outcome of an interdisciplinary collaboration between the two authors following a two-year exploration of mindfulness as applied to our own and allied disciplines. We also developed an integrative understanding of the interdisciplinary process. Further, together, we are in the process of campus-wide mindfulness infrastructure and an interdisciplinary graduate minor on Mindfulness and Contemplative Engagement centred on the course profiled in this paper. While limited in sample to one class, our experience supports the research findings that mindfulness can increase empathy, prosocial behaviour, and self-regulation essential for collaboration[22]. The collective experience balanced the deep, individual work completed in the asynchronous portions, creating a more positive learning experience for everyone. Student feedback suggests (see representative quotes below) that the retreat, even in the online format, created a sense of community and intimacy to transcend disciplinary egocentrism and be open for collaboration and learning.

"The exercise of active listening led by Dr. Christian [sic] during the retreat was an example of this liberatory practice. It gave me an opportunity to learn that I could be present and open by myself and with other people. When noticing what the other person was saying I could practice mindfulness principles but also discuss with my collaborator what I could have done and how they felt my presence. This is the learning that excites me the most." PhD Student in Clinical Psychology

"In these changes throughout my journals I've found a few exercises to have been catalysts or aha moments. For example, the retreat felt like a really big moment in the semester, because I found myself connecting with a vision of how mindfulness could connect me to a sense of liberation. I felt a sense of clarity around how mindfulness felt, for me, a part of my own self-preservation and growth. The reflections I had from the retreat very much so guided me through the second half of the course." Undergraduate Student studying Liberal Arts.

Based on this, we propose that incorporating mindfulness and contemplative pedagogy practices will benefit interdisciplinary collaboration. However, this is the first time we have taught this course, and therefore, we have not developed a group project to map and measure student engagement and output from an interdisciplinary lens. We plan to do that the next time we teach the class together and hope to collect data on student interdisciplinary learning competency.

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BLENDED GOLD STANDARD PROJECT BASED LEARNING (GSPBL) AND THE DEVELOPMENT OF 21ST CENTURY SKILLS – AN AGILE TEACHING STYLE FOR FUTURE ONLINE DELIVERY

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INTRODUCTION

The refined engineering programmes and updated curricula at the University of Exeter (E21 - Engineering the Future) strive to create talented technology innovators for positive global impact during the 21st Century. Blended Gold Standard Project Based Learning (GSPBL) was applied to selected Stage 1 and 2 modules to equip students with a technical and entrepreneurial mindset and develop 21st Century Skills.[1] These skills prepare students to progress into the research-led learning phase of the updated programmes in Stage 3 and 4 and finally showcase their success at the Exeter Engineering Conference.[2]

These modules were designed as part of our move to blended learning with online resources, asynchronous peer/facilitator forums, online quizzes, multimedia submissions and asynchronous online collaboration tools. High quality contact time alongside industry experts, entrepreneurs and student maker champions was planned to complement the digital elements with experiential learning in practical interactive workshops on team building, emotional intelligence, resilience, Lego Serious Play (LSP) and prototyping in the maker space.

The nature of these close collaborative activities required the challenge of a pivot to online delivery during the pandemic.[3] The authors reflect on the necessary online pivot of two of the most physical team-based activities (LSP and prototyping in the maker space) and review student engagement, outcomes and outline lessons and future plans.[4]

Blended Gold Standard Project Based Learning (GSPBL)

GSPBL is a process with seven essential elements applied to curriculum design, development and implementation. [5] It is a vehicle for 21st Century Skills development [6] that was previously piloted in our Entrepreneurship 1 module [7] and more recently applied to a Multi-Disciplinary Group Challenge Project to pose real-world problems and facilitate students through the application of core engineering theory and advanced technology during the IDEO Design Thinking process. [8]

Publications[9] [10] regarding the future of teaching and learning in High Education, support the shift from purely lecture and exam based individual learning to the inclusion of complimentary challenge projects, lecturers acting as facilitators and group learning. These projects encourage industry

engagement during the project launch to illustrate the context of these real-world challenge projects and trigger curiosity and innovation.

Planned activities for 21st Century Skills Development

A previous publication[11] referred to the unique combination of GSPBL and EntreComp as a progression model [12] to inspire and track 21st Century Skills. The GSPBL Entrepreneurship 1 and Multi-Disciplinary Group Challenge Project activities start with an authentic Project Launch to trigger inspiration with industry guest speakers and on-site interactions with advanced technology. Ice breakers, team building tasks and emotional intelligence workshops were created based on feedback from early pilot modules, suggesting the need for team building in low pressure, fun activities. Once foundation communication and collaboration skills were established, students were encouraged to elect a Project Manager for early research and ideation activities such as Design Sprints, LSP and Innovation Workshops with Entrepreneurs in Residence (EIRs). Fail fast techniques were planned in a maker space to aid with problem solving and iterative innovation through sketching, 3D modelling and physical prototyping. Rayna and Striukova comment that maker spaces "help develop both hard (e.g. electronics, 3D modelling, 3D printing, robotics) and soft (creativity, design thinking, prototyping) engineering skills".[13]

Importance and tracking of 21st Century Skills Development

The World Economic Forum support the need for graduates to gain 21st Century Skills suggesting that "the top skills and skill groups which employers see as rising in prominence in the lead up to 2025 include groups such as critical thinking and analysis as well as problem-solving, and skills in self-management such as active learning, resilience, stress tolerance and flexibility".[14] EntreComp is used to identify and track the progression of 21st Century Skills using a cohort wide survey for all students from the start of Stage 1 to the end of Stage 2. [15] Our EIRs sponsored and awarded 21st Century Skills prizes in for five individuals (Steven Senior, Signbox Ltd) and one team of students (Nick Russill, TerraDat (UK) Ltd). It is essential to capture this analytical survey data (Figure 1-3) and award prizes for 21st Century Skills for documentation on graduate CVs, with solid examples of these capabilities for elaboration at interview.

In a recent meeting, Jeremy Budd (Vice President of IBM UK & Ireland) emphasised the importance of providing examples of 21st Century Skills on graduate CVs, "the rate of progress in technology is rapidly creating new jobs and changing how many existing jobs are done, so it's vital that graduates are able to demonstrate their transportable skills such as adaptability, resilience, creativity and collaboration with real examples from their academic, sporting or personal lives".[16]
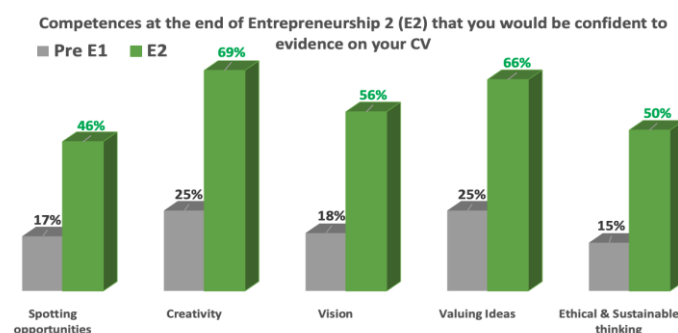
Figure 1. EntreComp: Ideas and Opportunities - Example of self-assessed survey data collected in Stage 2 (E2 - 2021) and comparison with the same cohort results from the start of Stage 1 (E1 – 2020)
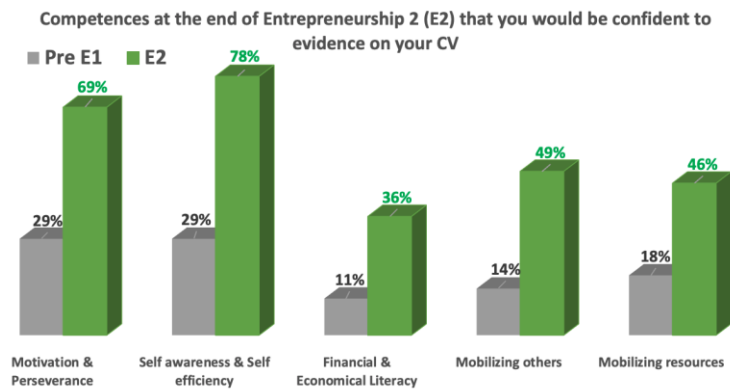
Figure 2. EntreComp: Resources - Example of self-assessed survey data collected in Stage 2 (E2 - 2021) and comparison with the same cohort results from the start of Stage 1 (E1 – 2020)
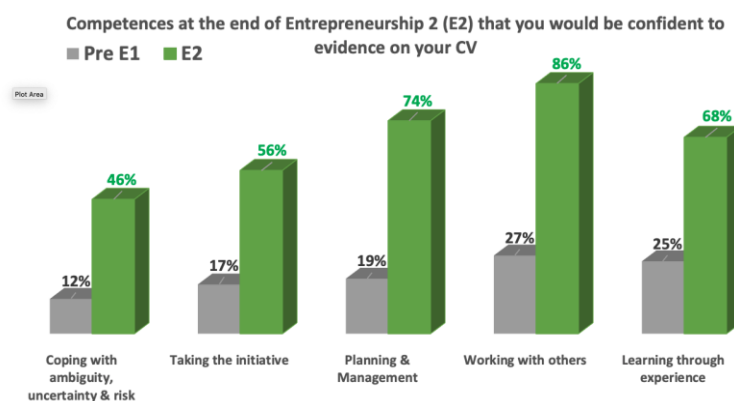
Figure 3. EntreComp: Into Action - Example of self-assessed survey data collected in Stage 2 (E2 - 2021) and comparison with the same cohort results from the start of Stage 1 (E1 - 2020)

PIVOT TO ONLINE TEACHING

Current literature regarding universities adapting to COVID-19, comments on the acceleration of digital transformation required to support learning communities "in what is now incontrovertibly a digital age and what others have described as the era of the 4IR".[17] The necessity to adapt during the pandemic has highlighted the need for high levels of 21st Century Skills in both staff and students. It is essential that education professionals take time to reflect and consider potential opportunities from this pivot to online teaching and learning to utilise our experientially gained specialist online teaching skills. The authors previous paper highlighted that "students can feel vulnerable in their first year around new peers, and this type of very exposed and open learning causes some social anxiety. We are yet to find out if these issues are reduced or increased with online activities … perhaps the multiple methods of virtual communication will create opportunities for modification to these modules in the new normal".[18] Many benefits were observed during the online pivot from some of our most physical and interactive activities and these digital benefits could be realised in future to allow freedom from physical space constraints, inspire through international guest speakers, revive excitement for learning and compliment future high quality F2F activities with asynchronous software. The authors have selected two traditionally F2F activities that were switched to online and document observations, student feedback and discuss lessons for future application.

Online Lego Serious Play for Problem Definition

LSP is a creative team building, ideation, communication, and problem-solving method where participants are led through a series of questions and scenarios to develop new insights to an overarching question or scenario. Johan Roos and Bart Victor created the Serious Play concept and process in the mid-1990s to enable managers to describe, create and challenge their views on their business. [19] Lego made the method open source in 2010 which opened the method up to a wide range of applications.[20] The Lego models, created through questions and scenarios, serve as a basis for group discussion, knowledge sharing, problem solving and decision making whilst ensuring everyone in a group contributes and is heard.

In the Entrepreneurship 1 module, the GSPBL Project Launch provided inspiration to kick start the process of defining a problem from the GSPBL driving question which was "How can you apply LiDAR (Light Detecting and Ranging) scanning technology to create a new product, service or process?" EiRs engaged students with video lectures on branding, project tips, industry case studies and videos shot at real-world sites demonstrating the application of this advanced technology.

LSP was fuelled by the inspirational project launch to facilitate communication and collaboration and investigate and define problems. Pre-pandemic, 2-hour LSP workshops were held F2F with students collaborating on large tables with one main LSP facilitator managing 11 groups of eight students in three sessions to cover all 250 students. Students would lead the individual build process and physically work together on the group build. The pivot to online learning necessitated the development of a new way to host LSP online. The physicality of modelling with the Lego was critical so 250 individual Lego kits were procured, some of which were posted to students and others were collected in a COVID secure click and collect process. LSP workshops were held on Zoom and Mural[21] to facilitate the live workshop. More facilitators were required for each online workshop and most of the University wide LSP facilitators were involved. A facilitator was present for each GSPBL group (in the main zoom room for instructions and breakout rooms for group builds) and each facilitator had two cameras (one for the facilitator and one for the LSP models). Each facilitator had multiple Lego kits to enable them to recreate each individual build model (eight models in total for each activity) and guide the students through the builds.

Students were led through a series of tasks using the Lego bricks, including short low-risk ideal holiday builds and metaphorical tasks to develop quick thinking, creative and communication skills. Once students built-up trust and discussion within the group, they developed an individual build to illustrate a problem aligned to the driving question, which was then broken down into essential elements (Figure 4). The workshop culminated in a LSP group build where students collaborated through the facilitator who used their individual elements to generate discussion and collaborative decisions to create a final group 'problem definition' build to align with the posed GSPBL driving question.
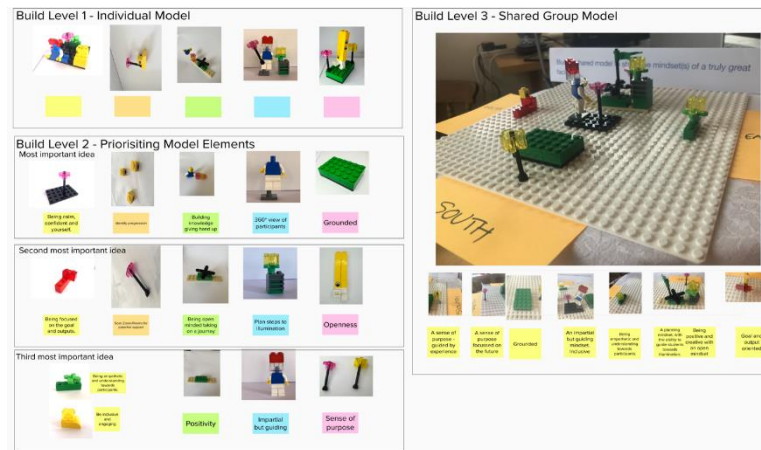
Figure 4. Example of LSP staged process and final group build

Online Lo-fi Prototyping for Ideation

In the GSPBL Multi-Disciplinary Group Challenge Project module, the authors incorporated a Design Sprint into the Project Launch to introduce students to the area of research. Fail fast techniques, low fi prototyping and collaboration unlocked student's creativity in a weeklong low pressure, non-assessed design task, using IDEO Design Thinking principles.[22]

Students used Zoom and Mural to collaborate and prototype using domestically available materials. A Mural board template was created for each day of the design sprint process, giving clear structure for collaboration. Students took part in ideation activities such as crazy 8s and lightening demos[23] (Figure 5) and built low fi prototypes. Using the previously tested and refined LSP staged approach, students collaborated on Mural picking the best elements of the individual prototypes and creating one final group design solution in preparation for their main project. Mural enabled the group members to work synchronously and asynchronously allowing students in different time zones to contribute to group activities.

The same process using Zoom and Mural was utilised for the longer duration main GSPBL project for further iterations of low fi prototyping alongside 3D modelling and Finite Element Analysis (FEA) simulation created in SolidWorks.
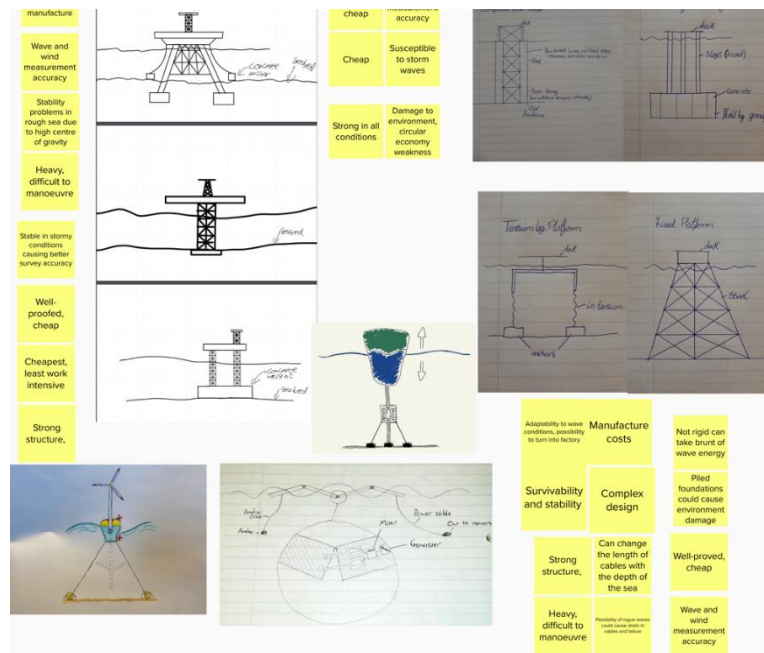
Figure 5. Example of student's ideation sketches

ENGAGEMENT AND STUDENT OUTCOMES

GSPBL groups consisted of the same eight students for both terms and social bonds were made in foundation activities such as team building, emotional intelligence and resilience workshops, which increased peer to peer engagement and slowly built-up staff-student relationships. The facilitation style aimed to create a flat hierarchy with a startup culture which set the scene for the LSP and online prototyping activities. It was especially important during the online pivot to develop playful, fun activities to maximise enjoyment, improve confidence and boost mental wellbeing during learning experiences.

It is difficult to reflect on whether the social anxiety felt by students in a 'normal' transition year was improved by the online activities because there were so many variables in the situation due to the global pandemic. There is no doubt, however, that the GSPBL activities and community building within the updated programmes supported students during lockdown. Observations by the authors and the rest of the GSPBL team and informal discussions with students suggested that activities such as LSP and online prototyping via Zoom and Mural helped them feel part of a community and they really enjoyed meeting others through this group work, "Project based learning has helped me meet new people on my course especially with COVID still lurking…was good to meet people since it's been difficult to meet people on the course".[24]

Twenty-first Century Skills development was successful for the cohort in the Entrepreneurship 1 EntreComp survey (percentage improvement from start to end of module) with all but motivation and perseverance increasing (Figure 6). Feedback included we "learned a good mixture of practical real-world skills…and some soft skills when regularly interacting with my team" [25] and leadership skills were particularly required within the team as the online projects needed careful organisation and delegation.

IDEAS & OPPORTUNITIES - Tick 1 or more competence(s) you would currently be confident to evidence on your CV (you may tick as many as required).

Answered: 100   Skipped: 0
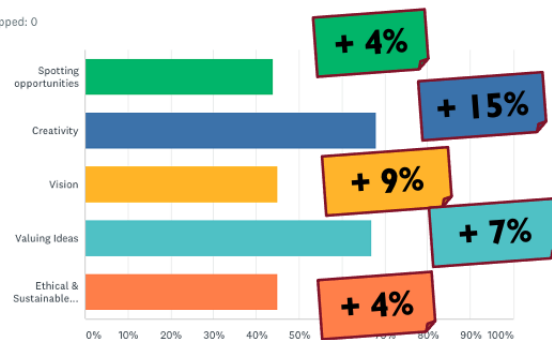
INTO ACTION - Tick 1 or more competence(s) you would currently be confident to evidence on your CV (you may tick as many as required).

Answered: 100   Skipped: 0
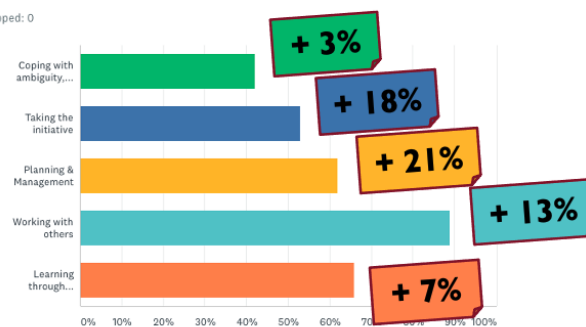
RESOURCES - Tick 1 or more competence(s) you would currently be confident to evidence on your CV (you may tick as many as required).

Answered: 98   Skipped: 2
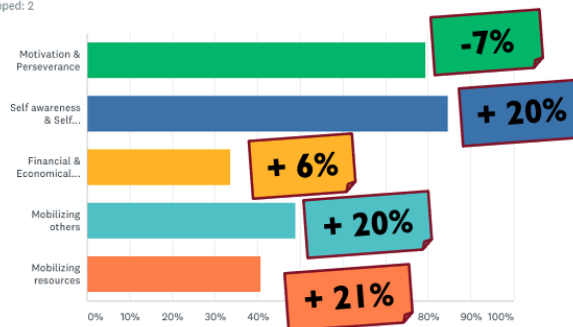
Figure 6. Change from baseline survey for cohort wide self-assessed EntreComp areas by the end of Entrepreneurship 1 (2020)

Online Lego Serious Play for Problem Definition

Students produced excellent outcomes from the LSP workshop, with next steps, ideas to explore and a clear problem definition. Students who chose not to access the flipped resources set before the sessions were able to catch up through the explanations of the advanced technology via Lego builds from other students. Overall, students were visibly engaged throughout the session, enjoyed this fun and creative way of learning. Most students opened up, felt part of a community and began to make connections.

Due to the rapid rollout of these workshops, some students failed to receive the LSP kits in the post, so the authors encouraged the use of MecaBricks.com,[26] an online platform building digital Lego.

This produced good outcomes but failed to create the same connection and playfulness as hands-on builds and a few students had issues with hardware and connectivity, which posed a barrier accessing the workshop. Some students elected to leave cameras off and did not partake in the session, but this was common in live online sessions and the same shyness can occur in interactive F2F workshops. Each facilitator recreated the student builds and collaborated with the students to gather opinions and instructions and create the final group build. This led to less social interaction and discussions between the group members in some online sessions.

The use of physical Lego bricks in online LSP helped students to open up to the rest of the group, develop creative confidence and improve their ability to communicate ideas. This improved level of communication was particularly apparent in students with English as additional language as Lego reduced language barriers. Students enjoyed moving from the main room into breakout rooms in Zoom and learnt how to listen online and provide constructive peer feedback within their groups, leading to meaningful collaboration and knowledge sharing and the start of successful problem definition.

The students achieved the desired learning outcomes, and the sessions were celebrated as a success considering the hurdles that were overcome.

Online Lo-fi Prototyping for Ideation

The prototype outcomes included the use of Lego, 3D printers, 3D printing pens and low fi materials such as cardboard and playdoh (Figure 7). Students demonstrated these group builds through YouTube videos and Graphics Interchange Format (GIFs) and some groups managed to meet socially distanced to test their prototypes in swimming pools and lakes.

The Design Sprint was very successful as an online activity and there were some excellent project outcomes that were creative and detailed. The students enjoyed the process, with one commenting this "Was unexpectedly my favourite module - working in a team, as well as being able to actively think of ideas in different contexts, was a lot of fun"[27] and gained a great background knowledge to begin the main project. Many of the groups went through further iteration and developed their initial concepts in the main project. The ideation and prototyping process from the Design Sprint and main project improved students 21st century skills in creativity, collaboration, innovative thinking and problem solving with feedback such as "I feel I learned a huge amount about interpersonal skills and team management…interesting and engaging way to teach 21st century skills." [28]

As suggested previously, some students saw this online prototyping as an "opportunity for innovation, but others struggle with the vast range of options, and fear they are not capable of the innovative thinking required".[29] Those who thrived were very creative with their use of materials (toilet roll holder tubes, food containers, tin foil) and methods of testing (baths, swimming pools, Figure 7). However, home prototyping was not successful for all students and some failed to create a prototype due to lack of confidence and apprehension around using lo fi materials.

In future, the Stage 1 team will utilise the Mural board layout and process to facilitate both asynchronous documentation of individual prototyping and synchronous documentation of group prototyping in the maker space. This online collaboration tool will enable students to collaborate and record progress in all areas (research, design, 3D modelling, prototyping) throughout the Design Thinking process.
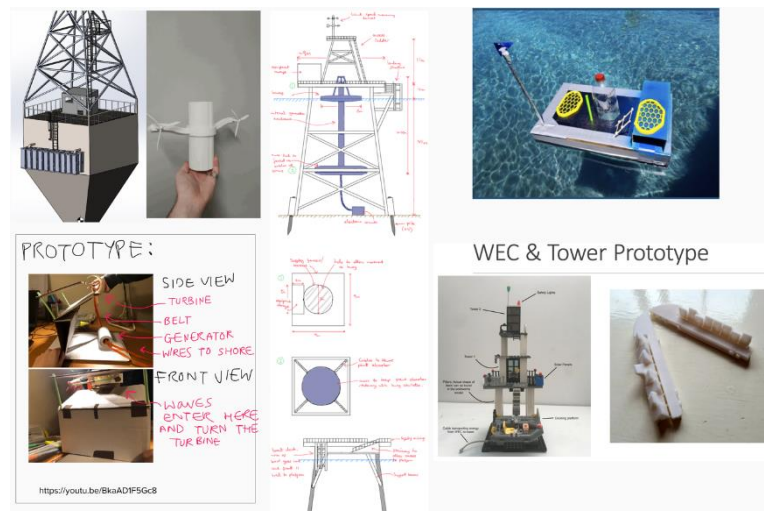
Figure 7. Examples of student's prototyping outcomes

LESSONS AND FUTURE PLANS

- Blended GSPBL is an effective mode of experiential learning and in collaboration with adaptable staff, is agile to pivot online.

- LSP is a highly physical and interactive activity for hands on creativity and problem solving. The plan for online delivery to 250 students in one day was ambitious and was the largest cohort ever attempted by the lead LSP facilitator. It was a very successful event in the University and the lessons learnt were utilised in many further online events.

- The methodology used in LSP with Zoom and Mural boards was also utilised in online prototyping. Training was provided by the GSPBL staff facilitators to both the department and college to share the technique to facilitate students through online projects using physical kits.

- Students prefer these activities F2F, but even when online, these activities provided essential support for students in the form of community building, team bonding, staff-student relationships and 21st Century Skills development.

- The department will continue to use Mural as an online tool for ideation, team collaboration and creative documentation of project outcomes.

- Further work is underway to review and improve engineering education in terms of equality, diversity, and inclusion and to ensure these new online techniques are accessible to all i.e., Apps and software used in future will be effective and consistent.

- Online GSPBL activities were successful and future work will explore applications for online teaching, summer schools, global outreach, industry engagement workshops and online CPD delivery with small cohorts (50 or less).

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[16] Jeremy Budd (Vice President of IBM UK & Ireland), meeting and email message to the author. May 2021.

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A PRACTICE OF TOGETHERNESS: AN EXPERIENCE OF ONLINE LEARNING DURING THE FIRST COVID.19 LOCKDOWN

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INTRODUCTION

This paper aims to share the learning practice carried out in academic year 2019/2020 of the PhD in Architecture at the School of Architecture, Art and Design (EAAD) of the University of Minho, in Guimarães, Portugal. Guided by the key motto "making-with", this cross-disciplinary program turned out to be predominantly an experience of online learning during the first Covid-19 pandemic lockdown. Under this totally unforeseen situation, how did we adapt the learning practice to online teaching? How did we cope with the uncertainty and the solitude of these times?

We start this paper by explaining the context of what happened. Then there follows a reflection on how we adapted to the contingency of time, and how this unfolded in three main scales of togetherness: a) the scale of the students and the PhD professor; b) the scale of the school and university; and finally, c) the scale of the planet, with international keynote speakers that otherwise would not be part of this journey.

I argue that if empathy is relevant in any practice of learning, in the online format it is critically vital. There is no "I" without the "other", as Bakhtin[1] stated. And this becomes even truer when we are faced with solitude in the confines of our own home.

This paper is made with the contribution [2] of the students of this PhD edition. Talking about togetherness implies integrating the individuals that belong to this group. This collective endeavor was only possible due to their generosity and willingness to keep going despite all the difficulties we were all experiencing.

CONTEXT

The PhD Program was launched on August 2, 2020, characterized a clear interdisciplinary vocation and aiming to question and rethink architecture beyond its limits, as an exercise committed to contemporary problems. It is not enough to do "for", it is necessary to do "with" — with people, with land and water, with the prosaic and the erudite. This implies a huge challenge for both academia and candidates who wish to be involved in this change.

The course opened with 15 applicants, with all the available seats filled, in contrast with the previous 8 editions, 5 of which did not open due to lack of minimum number of candidates. In this circumstance, the challenge I was given involved creating a course from scratch, which proved to be a

particularly demanding and passionate endeavor. In addition to defining the course strategy, it also involved defining the contents of 3 curricular units (CU), namely: Advanced Knowledge Seminar, Methodologies and Practices of Research in Architecture, and Thesis Project. We adopted a Competence-Oriented Research and Education approach, in which the student becomes co-designer of their learning process. As Sarah Shrbaji notes:

"The strategy of teaching and learning throughout the academic year has resulted in having a project thesis ready to be worked on immediately. The teaching was more focused on guiding the student to a more specific exploration about their theme (…). The teaching also focused on external inputs from architecture and other fields of study that could relate to the research theme of each student, whether from a range of bibliographical references or from the weekly seminars that included reflections and discussions about interdisciplinary subjects. The learning thus became more of a process to improve the contextualization and objectives of the research work."[3]

The course's weekly classes held on Fridays had two CU's in the first semester: Advanced Knowledge Seminar (ACS) (2-4pm) and Methodologies and Practices of Research in Architecture (MPIA) (4pm-6pm). We began on February 14, 2020 with the inaugural session:

"I felt I was coming home, both because of the geography and the warm-heartedness generated by those who were already familiar and the new friendships that I confidently trust will be perpetuated in time. Already in the inaugural class this School positively surprised me by focussing on innovation, interdisciplinarity and humanism. There followed an intense path of knowledge, new challenges and successes, and also a lot of uncertainty..."[4]

On this day, our WhatsApp group was created following Filipa Corais' idea. The inaugural session was followed by 3 afternoons of face-to-face classes: on February 21 and 28, and on March 6, 2020. Retrospectively, the last one already anticipated that something was about to happen. We had the privilege of having Pro-rector Professor Paulo Cruz as guest lecturer at the ACS. At the time, the professor had already been appointed president of the Commission for the Preparation and Management of the COVID-19 Contingency Plan of the University of Minho. He was a professor at our School, whom I knew well for his calmness. His nervousness in this class immediately struck me as odd, as well as his constant presence of his mobile, which he could not turn off in the scope of his responsibility regarding the pandemic. None of us knew what would ensue. The next Tuesday, March 10, 2020, the University was closed, and consequently our School.

Abruptly, we all were sent home and told that it would be for a period of 15 days if in the meantime everything returned to normalcy. It didn't; the pandemic just got worse and we stayed at home. Within a week, we switched from face-to-face teaching to distance learning. In the case of the PhD course, we used the Zoom platform to conduct the classes. So, on March 20, a week after the closing of the campus, we resumed classes in online format — but only the Methodologies (MPIA) classes. At the time, both me and Professor João Cabeleira, the president of the Pedagogical Council, considered that the Advanced Knowledge Seminar should be suspended, since this Curricular Unit is structured with invited Professors from several disciplinary areas and is geared towards collective critical debate. We considered that the immersive experience of being in the same space at the same time was fundamental for the Seminar's goal to be accomplished and that this would not be replicable via distance learning.

The period of 15 days passed and we did not return to school. In fact, we would only return in the 2st semester, in October 2020. We had to change our strategy and assume that we did indeed have to restart the Advanced Knowledge Seminar in online format. After reorganizing the guest lecturers' schedule, on April 17 we resumed the weekly lectures, which ended on July 3rd.

SCALE 1 – BETWEEN THE STUDENTS AND ME

From February 20 to April 10, 4 whole afternoons, it was just us, the students and me, focused on the study, presentation and discussion of research methodologies. This immersion was important from the scientific point of view, because we had time to study the complex polyhedron of methodological approaches and, above all, the correlation between the How? (methodologies) and the What? (research theme) of each student. There we were, sharing a screen, each one of us in his own home; sometimes children passed by on the room; other times, the sound of someone in the family was heard. Private life and work blended, without frontiers or limits. Solitude; each one of us at home; some foreign students with no home environment network in Guimarães or Portugal. How to deal with all this? How to continue? How could we mitigate the suffering and uncertainty we were living?

Diana Gouveia (2021) expressed that "the learning experience in the doctoral group was very enriching. Firstly because of the diversity within the group; the different backgrounds and professions turned the exchange of opinions and the mutual sharing into a constant learning process."

Friday's afternoons became the "Kairos moment", when we were together, building up trust, empathy and a sense of belonging. We would discuss about scientific matters, but we would also share what we were experiencing. The class time was rarely kept; we would repeatedly have "endless" conversations about not only the academic contents, but also about everyday life — about our feelings, our fears too, about seemingly minor things. All of this turned the human side of kindness even more poignant than when we were at the school. As Ana Vilar pointed out:

"A deeply inspiring and motivating weekly moment became intrinsic to the rhythm set by our Friday classes, in an atmosphere of empathy and knowledge sharing, to which it is imperative to acknowledge the extraordinary dedication of Professor Cidália Silva with her contagious energy, tirelessness and excellence in both guiding the sessions of Methodologies and Practices of Research in Architecture and the Doctoral Program in Architecture, simultaneously with rigor and sensitivity."[5]

Those who have done a PhD know how this path of defining an idea or a theme aiming at making an original contribution to the knowledge required at doctoral level, is a path of discovery with advances and setbacks that feed off each other. We all worked together in order to make this an easier road to take:

"Throughout this academic year it was possible to share experiences, live many others and build a journey of many desires. (...) The collaboration of all, the willingness to contribute so that the researches could develop in the best way possible, all this during a year full of uncertainties — was undoubtedly a relieved breath."[6]

Throughout the academic year we shared the bibliographic references on the OneDrive platform. The WhatsApp group was also important in this process, for everyone shared contents, conferences, specific bibliography that might interest a fellow student, etc. Each student understood that they could do their own work and simultaneously make a contribution to the others', , realizing that in this integral exchange all would accomplish more successful results. It is time to understand that success is collective not individual, even in the competitive environment of academia. Above all, this period allowed us to become an *esprit de corps*[7].

SCALE 2 – BETWEEN THE *ESPRIT DE CORPS* AND THE PORTUGUESE KEYNOTE SPEAKERS

"The first year of the PhD (…) was a very intense experience and allowed a broadened perspective of both the disciplines themselves and the sense of belonging to an academic community through the relationship among fellow researchers and with professors and lecturers."[8]

In order to meet this PHD edition's interdisciplinary goals, the Advanced Seminar Knowledge relied on the participation of renowned researchers from different disciplinary areas, both coordinators of ongoing Research Projects at Landscape, Heritage and Territory Laboratory (Lab2PT/UM) and other professors from Uminho. By exploring this synergy, PhD students had opportunities to integrate these and other projects, thus promoting research intended to be increasingly robust and collective. We brought together professors from the fields of engineering, geography, sociology of childhood, history of architecture, architecture and social participation.

After the five-week break of the Advanced Knowledge Seminar lectures, we restarted online on April 17, 2020. "The lectures offered by the doctoral program presented a high quality at the level of Professors and themes that greatly influenced the direction and methodology of the Work Plan I developed."[9]

These were open lectures, where everyone could participate. At this point, we had both Curricular Units up and running again. Week after week, on Friday afternoons we created a "new normal". The digital learning became a:

"(…) space for interaction, inherent to the group/network of work and friendship that was thus formed – between classroom, Zoom window, OneDrive platform and WhatsApp group. Despite the times of uncertainty with which this space coincided, I would highlight the sense of mutual help and togetherness among colleagues at all stages of this journey, the generosity of professors in imparting knowledge and sharing their own doctoral experiences, and the benevolence and humility of the guests during the Advanced Knowledge Seminar sessions."[10]

This Seminar fostered an extensive interaction via an internal and international network of exchange of knowledge. Each invited professor brought their own geographies, references and research times. In this way, they expanded the territory of our room to encompass the territory of Portugal and beyond. In each lecture, we moved between the past and the future, and for moments we had the opportunity to imagine ourselves there, in other places and times. Consequently, the *esprit de corps* had transformed itself into a larger socio-spatial network.

SCALE 3 – BETWEEN THE *ESPRIT DE CORPS* AND THE INTERNATIONAL KEYNOTE SPEAKERS

In this context, and even saddled with heavy financial constraints, we were able to recruit the participation of a series of internationally recognized lecturers (Figure 1) external to the School/University namely: Jane Rendell[11], with her lecture "From autopoeisis to sympoeisis"; Shelley Sacks,[12] who also joined us in this lecture; and Tim Ingold[13] with the theme "Making Growing Thinking", in which we had 75 participants from various nationalities.

Figure 1. Invited International Keynote Speakers

Bringing together these world-renowned experts, including Asiya Sadiq Polack and Christophe Polack[14] to an open platform of critical discussion become a window of freedom and togetherness. In this platform, everyone interested was welcome to participate. Unexpectedly, in our virtual space we had people from the most diverse places in the world, Brazil, UK, Belgium, Pakistan, Iran, etc., and what was meant to be a closed teaching and learning experience between the students and the professor become a platform of interconnectedness between different places, cultures, lives, and experiences.

This paper argues that this experience was only possible due to the unexpected situation we were all living at that period. The invitation to the keynote speakers was done as an adaptation plan to the compulsory shift to online education. With such a short notice, we relied mostly on their generosity. Being a peripheral school of architecture, burdened by budget constraints, no longer a disadvantage. Something singular had happened here: togetherness. We all desired to connect somehow — by living in a time of physical distance, being with and for the "other" become more crucial than ever, not only for the learning practice but especially for our survival as humans.

The *esprit de corps*… And the room became our planet. And the planet became our room. On October 13, 2017 I wrote a manifesto claiming for a planetary school (Figure 2). Somehow, this PhD Course turned out to be our Planetary School.

The Planetary School Manifesto
The planetary school demands

The right to learn and play in every place
To freedom
To interaction
To know that here and there are co-existent
I touch the ground with my face and I Know

The land is infinite
It is planetary
The water is infinite
It is planetary

This small place is my planet
And I am infinite
The planet is my home
Homing the planet

Being here and being there
simultaneously
Learning by playing

Learning Fields
of hope and freedom
to create oneself
in the realm of generosity and conscious being
I am in you
you are in me

Learning to live and to inhabit
the in-between
the planetary landscape inside my pocket
I am the garden
and you too

Cidália Silva, Calouste Gulbenkian Foundation, Art Library, Lisbon,
October 13, 2017.

Figure 2. The Planetary School Manifesto, Cidália Silva, October 13, 2017.

THE SCALES OF TOGETHERNESS

In this paper we demonstrated how the practice of togetherness unfolded in three interconnected scales: the scale of the students and the professor, generating an *esprit de corps*; the scale of the school and the University became an opportunity to understand architecture in an holistic way by opening up to different, sometimes contradictory, perspectives; and, finally, the scale of the planet, by featuring professors that otherwise would not be available was an unprecedented opportunity. They brought stimulus for thinking and imagining possible scenarios for research, expanding the desire and joy for knowledge.

Finally, we need to highlight the equality of opportunities provided by online learning for students that are living abroad, or needed to move to their home country due to the pandemic, because in this format they were able to continue to attend this course. During this academic year, student Cláudia Manso got pregnant and shared some sensitive words:

"Despite all the awfulness that came with the pandemic, the adjustments to teaching in my case ended up being a tool of opportunity and equality. Shortly after I started the PHD, I found out I was

pregnant. During the pregnancy, online teaching allowed me to build a relationship with my colleagues and faculty, giving me a sense of closeness, togetherness and companionship during a time that, given the circumstances, could have been very lonely. After my son was born at the start of the second semester, online classes enabled me to continue with my studies, which gave me a feeling of normalcy at a time when everything was changing. Most importantly, it felt I had the same rights and opportunities as my fellow colleagues: my studies were not affected as I was able to attend all classes, which otherwise I wouldn't be able to do under normal circumstances, and so I didn't have to choose between my previous projects/work and my newborn baby. I was given the means to do/be both."[15]

Nonetheless, we all miss being at the school, together, in presence. Although this was an incredible experience in many senses, it was also exhausting and full of up's and down's. Not all the enrolled students ended the PhD Course, mainly due to the economic crisis situation brought about by the pandemic.[16] Nine students finished the academic year by publicly defending their Thesis Project and are now continuing their doctoral research in a tutorial format.

Therefore, should virtual learning replace the physical space of the school? My answer is no. But it would also be a loss to forget the opportunities offered by online learning exposed in this paper. For those that have internet service, this is a mean to access learning that otherwise would not be possible. But, in the end, we all desire physical presence and togetherness. Therefore, it is time to go back to school and integrate the opportunities brought about by the pandemic crisis.

NOTES

[1] Mikhail Bakhtin, *The Dialogic Imagination: Four Essays,* ed. Michael Holquist, trans. Caryl Emerson, and Michael Holquist (Austin: University of Texas Press Slavic Series, 1981).

[2] I asked the students to send me by email a written feedback about their experience in the doctoral course in the academic year 2019/20.

[3] Sarah Shrbaji, email message to author, May 20, 2021.

[4] Filipa Corais, email message to author, May 24, 2021.

[5] Ana Vilar, email message to author, May 24, 2021.

[6] Maria Rita Assunção, email message to author, May 24, 2021.

[7] My gratitude to Dr. Joaquim Borges who in an inspiring conversation about this paper shared this notion of *esprit de corps.*

[8] Débora Moura, email message to author, May 25, 2021

[9] José Miguel Oliveira, email message to author, May 27, 2021

[10] Ana Vilar, email message to author, May 24, 2021.

[11] Jane Rendell (BSc, DipArch, MSc, PhD) is Professor of Critical Spatial Practice at the Bartlett School of Architecture, UCL, where she co-initiated the MA Situated Practice and supervises MA and PhD projects. Jane has introduced concepts of 'critical spatial practice' and 'site-writing' through her authored books.

[12] Shelley Sacks is Professor and Director of the Social Sculpture Research Unit, Subject Coordinator: Masters in Interdisciplinary Arts; Masters in Social Sculpture, School of Arts, Faculty of Technology, Design and Environment of the Oxford Brookes University.

[13] Tim Ingold is Professor Emeritus of Social Anthropology at the University of Aberdeen, Scotland. His more recent work explores environmental perception and skilled practice. Ingold's interests lie on the interface between anthropology, archaeology, art and architecture.

[14] Asiya Sadiq Polack and Christophe Polack, Partners at The Architects Polack and professors at the Faculty of Architecture – KU Leuven Belgium, have lived and worked together in Karachi and Brussels since 2000, merging their diverse expertise into a socially responsive spatial practice.

[15] Cláudia Manso, email message to author, May 25, 2021.

[16] For any of you reading this paper, remember: failure and success are dialogic, as Edgar Morin taught us in one of the principles of Complex Thought. See Edgar Morin, Introduction à la pensèe complexe (Nanterre: *ESF* éditeur, 1990)

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TEACHING ARCHITECTURAL DESIGN IN A TIME OF CHANGE: DIGITAL TOOLS AND METHODOLOGIES

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INTRODUCTION

The following paper presents part of an on-going research project that is exploring theories, methodologies, tools and resources in architectural design teaching activities. In particular, the work presented in this writing focuses on digital tools and methodologies applied during the design development process. Moreover, the work proposes these tools and methodologies for teaching activities related to architectural design and suggests new lines of research. The research draws upon experiences and reflections accumulated since the 23rd of March 2020, which marked the beginning of the first lockdown in the United Kingdom. The unexpected situation created by COVID-19 has subverted our daily lives, including our academic activities. The current situation is impacting all teaching activities but especially in creative disciplines, including architectural design, which require real-time interaction between tutors and students around the same project. Lecture-based modules in architecture and several other disciplines are not affected in the same way by the current constraints.

During architectural design activities in the studio, tutors and students exchange and explore ideas through verbal and graphic/visual interaction. Tutorials and reviews represent essential learning moments where tutors and students use drawings, models and sketches made on the spot during meetings to clarify concepts and/or suggest ways of developing design ideas further. Hence, sketches and drawings are used as a visual language that supports, expands or clarifies verbal explanations. It is evident that in this context, oral and visual communication support and complement each other.

Obviously, moving all our tutorials online has limited this kind of real-time graphic/visual interaction. Lecture-based modules and standard research conversations and collaborations through, for example, text-based documents, are not affected in the same way by the current situation. Moreover, interaction during design tutorials cannot be substituted by asynchronous sessions such as recorded lectures or recorded tutorials because, during design tutorials, students and tutors explore creative solutions together interactively, and each exchange of ideas can open up exciting new hypotheses and investigations which foster further conversations and design ideas. Each design solution is different and involves a personal development tailored around each student's design and cultural preferences.

The current paper presents digital tools and methodologies which can support architectural design teaching activities both online and in the studio. In particular, it focuses on using a tablet and specific applications which support activities around communication, sharing and representation. The findings can inform activities in teaching, research and practice.

TEACHING ARCHITECTURAL DESIGN IN A TIME OF CHANGE

Since the first lockdown, there have been several changes in the way studio design is taught and managed. From the 23rd of March 2020 until the end of that academic year, all teaching activities in the UK suddenly moved online. Obviously, the unexpected situation posed several challenges. In the period leading up to that specific moment in time, students had been developing their design projects through weekly tutorials. It was therefore necessary to quickly adopt an appropriate way to support the students' design development and interact with their work. It was evident that the use of analogue tools would not be adequate in this kind of remote learning environment, but luckily, there are several digital tools that can support design tutorials remotely.

TABLETS AND DIGITAL SKETCHING

Graphic tablets are digital input devices which, thanks to the use of styluses and pressure-sensitive drawing surfaces, provide users with sketching and hand-writing experiences that are quite natural and close to those produced by using analogue tools such as pens and pencils on paper. Because the stylus is pressure-sensitive, different levels of pressure can provide a wide range of marks and effects. On CumInCAD,[1] a Cumulative Index of publications in Computer Aided Architectural Design supported by the most relevant associations in the field,[2] a quick search for the term 'digital sketching' shows only 16 results, and only one piece of writing published after 2015 on this topic. This may be partly due to the fact that the more advanced stylus pens and touch screens have only been released in recent years. The Apple Pencil[3] was released in 2015, and Microsoft's new Surface Pen[4] for the Surface Pro appeared in 2017. These continuous technological advancements, which often happen quickly, have made information and reflections contained in previous research publications on digital sketching obsolete. For example, the digital pen and paper used for writing and sketching in 2005[5] had various technical and functional limitations, and have been amply surpassed by subsequent technologies. The most recent article on digital sketching available on CumInCAD was published in 2019; it makes a comparison between pen-and-paper and digital sketching in architectural education[6] and uses linkography analysis.[7] Hence, there is an evident lack of recent investigations, especially of a practical nature, of the use of technologies and representational techniques for digital sketching in architecture. This situation clearly identifies a research gap into which this project fits.

Reflections and selection of an appropriate tablet

At the beginning of the first lockdown, the author started using a WACOM[8] Intuos graphic tablet connected to a laptop via a USB cable. The tablet proved to be effective during design tutorials because, thanks to the stylus, it was possible to easily highlight elements on students' work, write down annotations and clarify points through quick sketches. Clearly, this is a kind of interaction that cannot be replicated with a mouse.

However, even though the graphic tablet represents a considerable improvement compared to a mouse for digital sketching and notetaking, the fact that the user needs to look at the computer screen while drawing or writing on the pressure-sensitive drawing surface, rather than looking at the movement of his/her hands, limits the hand-eye coordination and makes the process challenging and the learning curve steep. After doing some research and elaborating some reflections, the author decided to opt for a tablet computer that allows drawing and notetaking with a stylus directly on the screen (which is also a touchscreen) of the tablet. In the last few years, the technology behind tablet computers and their styluses has become sufficiently mature to replicate in a satisfactory way what we can do with several analogue tools. Within various software packages, the pressure-sensitive stylus makes it

possible to digitally simulate different media (and related strokes) including pencils, brushes and pens. With this stylus, we can sketch, draw, paint and write.

After undertaking research about tablet computers, the author selected a Microsoft Surface Pro 7[9] for its high performance and because it has a Windows Operating System (OS) rather than a mobile operating system (Figure 1). Other criteria in the selection of this tablet included reflections on the ways in which the remote tutorial sessions could be run to support students in the best possible way. The possibilities for development and support of research activities not connected to teaching were also considered. With a Windows operating system, the tablet can run the same software packages that it is possible to run on a laptop (or desktop computer), while other devices would present compatibility issues that would limit or slow down the interaction between the different devices. With tablet and laptop using the same operating system, the exchange of files between them is seamless, and this opens up new opportunities. The use of a stylus and the facility to manipulate images on a touch screen replicate the immediacy of the actions and visual communication that take place during tutorials in the design studio.

Figure 1. A Microsoft Surface Pro 7 (image source: author's personal archive).

Digital Sketching and Notetaking

There are many digital sketching tools that can be used with a stylus and a tablet, including free and open-source alternatives. As part of this research, the author is exploring various digital applications including Adobe Photoshop[10] and OneNote.[11] Both software packages are available for PC and Mac. Photoshop, besides providing powerful image editing capabilities, also makes available many tools for digital sketching and painting. The software has a wide selection of brush tools that can emulate various media such as brushes, pencils, inks, charcoals and chalks. An already wide selection of available brushes can be customised and an unlimited number of new brushes created. Hence, within one single device and one single application, there are endless creative opportunities.

The use of a tablet and digital sketching and notetaking applications during online tutorials generates a higher level of engagement, because students see the tutor's drawings and notes on their work taking

shape on the screen in real time and while the conversation is going on, similar to what happens during tutorials in the physical studio environment.

OneNote is a free notetaking software package developed by Microsoft and fully integrated within Teams. Within OneNote, it is possible to create digital notebooks which provide innovative ways of collecting, recording, organising and sharing information and ideas. Each notebook can include an unlimited number of pages, and each page is virtually unbounded so it can gather very diverse information and files, including texts, pictures, tables, drawings, hyperlinks, video and audio files. A digital notebook can complement and expand the use of a traditional physical sketchbook/notebook.

METHODOLOGY

As part of the methodology, the author is undertaking several activities, including:

• Reading and studying sources about digital sketching and drawings;

• Testing specific software for digital sketching and drawing, including Adobe Photoshop and open-source alternatives;

• Testing use of the tablet during online design tutorials and in supporting students' work;

• Exploring ways of collecting, sharing and manipulating visual information in interactive ways;

• Selecting content related to architectural design, theory and representation to be delivered online, and reflecting upon alternative ways of delivering it;

• Defining and testing a digital workflow that can support design development;

• Exploring how digital sketching, painting and drawing could be connected to 2D drafting and 3D modelling.

The whole methodology is multidisciplinary because the sources being used are also from other disciplines, including concept art for cinema (e.g., the publication The Movie Art of Syd Mead[12]) and video games (e.g., art books of video games pertaining to the Assassin's Creed video games series, such as Assassin's Creed Unity[13]). The above activities have also been informed by exchanges of ideas with international scholars who are facing the same challenges in several countries, and who are experts in the field of architecture and digital technologies. So far, the author has had conversations with academics from Brazil, Denmark, Japan, New Zealand and the United Kingdom, discussing several different methodologies and digital tools.

THE ROLE OF DIGITAL TOOLS DURING DESIGN TUTORIALS: COMMUNICATION, SHARING AND REPRESENTATION

This section describes how the tablet and two software packages have been used, firstly during online design tutorials and subsequently during sessions on campus.

Remote Design Tutorials: First Digital Workflow

The digital tools used during the design tutorials could be classified into three main categories: one related to audio/video communication, a second one that refers to file sharing, and a third that concerns graphic/design communication/interaction. At the beginning of the pandemic, ZOOM was selected as the primary audio/communication tool between students and tutors. Later on, that application was substituted by Microsoft Teams,[14] a communication platform which includes many functionalities and is part of Microsoft 365.

The students usually submitted their files (in PDF or PPT format) onto Brightspace (a virtual learning environment (VLE)) before the tutorial, and the tutor downloaded them in advance or, in the case of

late submissions, during the actual session. The tutor then shared the screen with the submission open in Adobe Acrobat or PowerPoint and gave the student remote control of the presentation to allow him or her to present the work. At the end of the presentation, the tutor regained control of the screen and started a discussion around specific aspects of the design development. Every time there was the need to sketch, highlight or write notes on the student's work, the page/screen was captured and opened in Photoshop, where the tutor was able to use the graphic tablet.

Remote Design Tutorials: Second Digital Workflow

Once Zoom had been substituted by Teams, OneNote was used instead of Photoshop to sketch and digitally annotate students' work. In OneNote, there are a few tools for digital sketching, namely, pen, pencil and highlighter. For each tool, it is possible to customise specific characteristics such as line thickness and colours. The available tools and parameters, despite clearly being minimal compared to the brushes and tools available in Photoshop, are more than enough to produce quick and communicative sketches, write down annotations and visually represent exchanges of ideas during online tutorials (Figure 2). Entire presentation boards, or smaller portions of them, were captured with the Snipping Tool and then copied/pasted onto a page in OneNote. At the end of the tutorial with each student, the OneNote page with the sketches and visual annotations was copied/pasted directly onto the relevant student's digital notebook within the same application, in order to have a record of the conversation regarding improvement of the work for the subsequent tutorial.

Figure 2. Screenshot of an example of student work with the tutor's visual annotations written down during an online tutorial (image source: author's personal archive).

A Class Notebook was set up at the beginning of the academic year for the two communication modules[15] in the first two years of the BA Architecture course. It was decided to use a common basic framework to help students organise their work and to enable tutors to check, assess and compare students' progress. Hence, each digital notebook has the following sections: Site Analysis, Design Development, Precedents Study, Digital Tools, Inspirational Images and Drawings, References and Sketches. However, each student can add new sections and add, within each section, as many pages as he or she likes (Figure 3). Several students started personalising their digital notebooks and adding sections for other modules, including History and Theory, and Technology. OneNote also allows

students to be supported asynchronously. Tutors are able to open students' notebooks at any time, see their progress and leave brief notes/feedback.
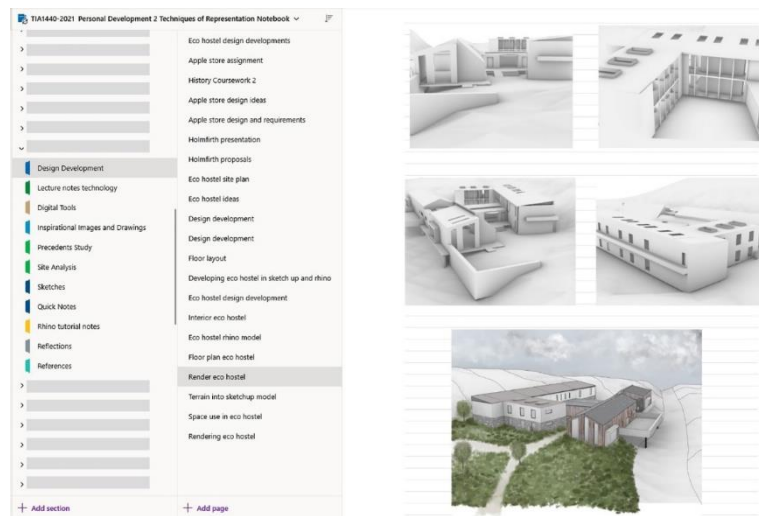
Figure 3. Screenshot of an example OneNote page from a student's digital notebook (image source: author's personal archive).

Tutorials in the Studio during the Pandemic

Even though the tablet was mainly used to support online teaching activities, experimentation with the device during remote teaching activities allowed the development of skills, reflections and methodologies that could be adopted for socially-distanced design studio activities on campus. At the beginning of this academic year, we ran small group tutorials with one tutor and five students each. Because of the situation, we were not allowed to touch each other's objects or tools, including drawings, physical models, pencils, pens or rulers. For this reason, a different approach was adopted. After the students' submissions had been downloaded on the tutor's tablet computer, the device was connected to a big screen through a wireless presenting platform.[16] This platform connected/mirrored the tablet's screen onto the big screen, which was positioned so that it was visible from all six tables of the small study group. For the tutorials, the students also brought in their physical sketchbooks/notebooks and models, which they showed to the tutor and other participants while describing the work presented on the screen. At the end of each presentation, the students and tutor engaged in a conversation about the content, and the tutor was able to draw attention to specific elements, highlight them and sketch with the stylus (Figure 4).

Figure 4. A student's work projected onto a big screen in the studio. By using the tablet and stylus pen, the tutor was able to sketch on the drawing and provide general feedback during the group's discussions (image source: author's personal archive).

TABLETS AND NEW OPPORTUNITIES IN ARCHITECTURAL EDUCATION, RESEARCH AND PRACTICE

The use of a computer tablet during different teaching and research activities has highlighted the potential of the device and various applications for digital sketching, painting and notetaking in architecture and related disciplines. All these changes could also affect other software packages (including CAD, 3D modelling and BIM) and the related digital workflows.

In fact, in another research study connected to this one, the author is also investigating a digital workflow which can support design development. In particular, it explores how digital sketching and painting, 2D architectural drawings and 3D models can be used during the creative process both remotely and in the physical studio (Figure 5).

Figure 5. An image from another on-going research project that is investigating a digital workflow including digital sketching and painting, 2D architectural drawings and 3D models during the design development (image source: author's personal archive).

The adoption of new technological devices will also allow tutors to introduce new teaching approaches and exercises and to connect these with other teaching activities in innovative ways, thus opening up new scenarios. When these tablet computers become more affordable, they will be able to positively affect not only the collaborative environment of a design studio, but also many areas of research and practice. The introduction of all these new technologies could transform the design studio into an augmented environment where digital tools and methodologies enrich and increase the number of possibilities. Moreover, the advantage of having a seamless digital workflow from digital sketching to detailing is evident, and this might also foster an increasingly paperless environment which could present some benefits in terms of sustainability. The versatility and handling of the new tablets and digital styluses make these tools also useful in outdoor environments, such as for urban sketching sessions.[17] Obviously, the use of these digital tools should always be supported by representational methodologies and techniques, including ways of taking visual notes.[18]

The introduction of digital sketching and painting in educational environments and in practice might also result in the development of better, more human design solutions where experiential and narrative qualities can have a central role. In recent years, these characteristics have been superseded in many interventions by purely functional projects with aseptic qualities that make buildings and places uncomfortable for users. Perhaps, in some situations, the use of particular digital tools may have constrained designers' creativity and limited the architectural qualities of those built projects. The inadequacy of several buildings and spaces (private and public) to host and support people's daily lives in comfortable ways has also been highlighted in many places and cities by the COVID19 pandemic. It is therefore hoped that the research gap identified by this paper can lead to several research projects and trigger many changes in the architecture field.

CONCLUSION

This paper has presented tools, methodologies and reflections accumulated during an on-going research project in which the author is investigating digital devices, tools and related methods applied during teaching activities related to architectural design.

The currently restricted situation of the pandemic is not revolutionising the way architectural design is being taught, but simply accelerating a process that was already under way, and several opinions have already been shared on this topic, including reflections on millennials in architecture.[19] Conversations are currently on-going about how to run future teaching activities, and it would also be a beneficial

idea to provide students with hybrid learning experiences once social distancing rules are no longer necessary. A combination of in-person learning activities in the studio/classroom with activities conducted remotely online could enrich students' learning journeys by adopting the best of both approaches. As described in the previous sections, the use of tablet computers together with other technologies and applications can also benefit the physical studio environment.

It is undeniable that new digital devices, software packages and related methodologies and theories will continue to reshape the design studio environment of the present and future. The knowledge and skills developed during this research will also inform other research activities.

ACKNOWLEDGEMENTS

NOTES

[1] "CumInCAD," accessed April 7, 2021, http://papers.cumincad.org/.

[2] The sibling associations are ACADIA, CAADRIA, eCAADe, SIGraDI, ASCAAD and CAAD Futures.

[3] "Apple Pencil," accessed April 7, 2021, https://www.apple.com/uk/apple-pencil/.

[4] "Surface Pen," accessed April 7, 2021, https://www.microsoft.com/en-gb/p/surface-pen/92fp8q09qhxc.

[5] Alexander Koutamanis, "Sketching with Digital Pen and Paper," *Proceedings of the 11th International Conference on Computer Aided Architectural Design Futures* (2005): 321-330.

[6] Heidari, P. & Polatoğlu, Ç., "Pen-and-paper versus digital sketching in architectural design education," *International journal of architectural computing* 17, 3 (2019): 284-302.

[7] Gabriela Goldschmidt, *Linkography: Unfolding the Design Process (*Cambridge, Massachusetts: The MIT Press, 2014).

[8] "WACOM," accessed April 7, 2021, https://www.wacom.com/en-gb.

[9] "Surface Pro 7," Microsoft, accessed April 7, 2021, https://www.microsoft.com/en-gb/p/surface-pro-7/8n17j0m5zzqs?activetab=overview.

[10] "Photoshop," Adobe, accessed April 7, 2021, https://www.adobe.com/uk/products/photoshop.html.

[11] "OneNote," Microsoft, accessed April 7, 2021, https://www.microsoft.com/en-gb/microsoft-365/onenote/digital-note-taking-app?ms.url=onenotecom&rtc=1.

[12] Syd Mead and Craig Hodgetts*, The Movie Art of Syd Mead: Visual Futurist* (London, United Kingdom: Titan Books, 2017).

[13] Paul Davies, *The Art of Assassin's Creed Unity* (London, United Kingdom: Titan Books, 2014).

[14] "Microsoft Teams," accessed 7 April, 2021, https://www.microsoft.com/en-gb/microsoft-teams/group-chat-software.

[15] The first-year module is entitled "Personal Development 1: An Introduction to Communication Skills," and the second-year module "Personal Development 2: Techniques of Representation."

[16] "Vivi," accessed April 7, 2021, https://www.vivi.io/.

[17] Uma Kelkar, *Drawing with a Tablet: Easy Techniques for Mastering Digital Drawing on Location* (Beverly, MA, USA: Quarto Publishing Group USA Inc., 2020).

[18] Norman Crowe and Paul Laseau, *Visual Notes for Architects and Designers* (Hoboken, New Jersey, USA: John Wiley & Sons, Inc., 2012).

[19] Darius Sollohub, *Millennials in Architecture: Generations, Disruption, and the Legacy of a Profession* (Austin, USA: University of Texas Press, 2019).

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MAPPING THE DISCOURSES. PERIODICALS AS A PEDAGOGICAL PROJECT FOR A [VIRTUAL] COURSE OF ARCHITECTURE HISTORY AND THEORY

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LITERATURE, ARCHITECTURE, AND MEDIA

In architectural design studios, online publications are currently used as conventional references and learning tools. Students regularly browse digital platforms and collectors like *ArchDaily*, *Designboom*, *Dezeen*, *Divisare*, online magazines like *E-Flux*, *Klat*, *Failed Architecture*, as well as blogs producing diverse forms of architectural criticism, such as *Socks* or *Bldgblog.* Before the advent of the digital, architectural magazines performed an analogous function. Nevertheless, unlike their online heirs, they are scarcely used and accepted as consistent pedagogical devices for teaching Architectural History and Theory in the Schools of Architecture.

Over the past decade, the interest in the relationship between architecture and media increased exponentially. In the framework of architectural history and criticism, this line of research solicited a scholarly production proposing theoretical models and practical approaches for studying the specialized 20th-century press[1]. In particular, it observes the implications for both architectural representation and the social role of professionals and institutions, as well as the processes of their legitimation and affirmation[2]. Research standpoints are heterogeneous, as they comprise reflections on the various genres and generations of magazines and their specificities[3], monographic studies[4], comparative volumes and essays collections[5], or again thematic conferences, digitalization campaigns, and research groups[6].

Although this research field is then rather prolific, there is still a lack of comparative studies. On the other hand, to date, little attention is dedicated to the role of architecture journals as teaching tools within pedagogical projects for teaching architectural history.

THE PEDAGOGICAL PROJECT

The seminar "Mapping the discourse. Periodicals as platforms for architecture and urban knowledge,"[7] framed in the course of Architecture History and Theory, dialogues with this last point. Since its first edition in 2015, the international composition of participating students contributed to the development of a distinct methodological procedure. Nonetheless, the pandemic and online teaching forced the definition, crystallization and formalization of a pedagogical project that considered the existing physical limitations and transformed the forced recourse to the online mode into an opportunity to experiment and strengthen the methodologies that had been hinted at in previous years.

The course looks at specific moments, discourses, and concepts that marked 20th-century architecture history, theory, and criticism, addressing specialized architecture and design periodicals as didactic tools for the teaching of architectural history. The pedagogical project does not look at publications only as sources for the writing of architectural history or simple editorial products to be investigated in their material and graphic dimensions, nor as instrumental media to intercept the disciplinary debate. Rather, it examines them as sites for the construction, legitimation, innovation, and dissemination of critical positions, models, and ideas. Architecture periodicals are in fact critically addressed in their cultural, theoretical, material, visual, graphic, and financial dimensions[8].

Therefore, the seminar approaches periodicals as comprehensive systems of knowledge and printed networks to be challenged and scrutinized in their interrelationships. Transversal critical reflections outline shared features, create "families," and identify possible "types" or "genres."[9] Students' analyses overcome monographic perspectives by introducing original cross-cultural and transnational readings, suggesting insights into the international dimension of the production, reception, and discussion of architecture and planning culture. Moreover, analyses address several under-explored geographical, cultural, and linguistic contexts. In this framework, introducing nuanced and mitigated ideas of modernity and rethinking consolidated histories and genealogies contributes to the revision and integration of existing historical narratives and prompts the elaboration of new ones.

An international community building a transnational database

Students were fundamental components in the digital and cross-cultural process of definition of the pedagogic project. The course has always been structured on an international community of students characterized by diverse architectural history and theory backgrounds. Because of the pandemic, the students who had just enrolled in the first year of the master's program never arrived in Milan, while many Erasmus students carried out their university exchange under unprecedented circumstances (meaning, at home in Milan, or back in their home country). Consequently, the global composition of the class and the encounter between different educational and academic networks inspired original investigations going beyond familiar cultural and national boundaries, corroborated by the potentialities of digital research and sharing.

The virtual condition of the course broadened the conventional network of references centered on the European, North American, and Latin American editorial panorama. As it solicited the use of resources and archives from the students' home universities and the survey of online databases, it promoted the study of architecture publications referred to under-explored publishing cultures often hindered by language barriers, such as the Eastern European press or publications from Turkey, China, India, and Iran. This panorama, even if fragmented, suggests a first questioning of the analytical and interpretative categories based on the study of Western European and North American journals, still profoundly linked to the history of the affirmation and decline of the project of the Modern Movement. Within this framework, in six years, students have researched around fifty periodicals published in eighteen different countries[10] between the 1920s and the 1970s, with special attention devoted to the editorial production during and after World War II.

Figure 1. List of investigated journals per country

At the same time, the project crossed and connected resources retrieved in physical libraries, archives, and repositories of articles and images – sometimes digitized by the students themselves – with online databases and digital collections of periodicals created by professional and cultural institutions, independent organizations, individuals, public libraries, and government bodies. The result was the creation of a shared "collective cartography," an infrastructure of references referred to extended geographies and new territories of knowledge[11] applicable in the study of architectural periodicals.

In this way, students actively contributed to share their knowledge, building a common ground and a collective platform aggregating, connecting, and sharing libraries, databases, archives, collections, ongoing research, and repositories. Even if the pandemic challenged the considerable on-site research component that characterized the seminar, students could approach periodicals as primary sources and confront themselves with the methodologies of historical research.

Moreover, an ad hoc course website acted as a collector of information and platform to share and exchange materials and knowledge. Starting from a set of provided references, students contributed with additional findings and digitalized magazines. Also, they implemented a folder of readings on the lessons' topics, often relying on their sending universities' digital subscriptions and contributing through the recognition of private collections.

The composition of the class and its active involvement affected the construction of the corpus of analyzed publications, but also the discussion of the distinctive traits of this collection. The course offered a valuable opportunity to question the processes of knowledge transfer and the phenomena of cultural translation. Besides, it allowed testing the potentialities of cross-cultural readings and fostering the discussion on the transnational and global dimension[12] of post-war architectural history from the methodological and thematic point of view. Physical limitations in accessing conventional primary sources hindered the exploration of this underlying international context. However, they were accelerated by the digital potential we have been forced to explore.

Genres, geographies, and chronologies

The proposed research exercise looks at the production process of magazines and at their relationship with cultural, professional, or institutional networks. Students were divided into groups of four and asked to select a journal and contributing to the seminar by proposing a critical reflection structured on the analysis of a significant and representative season or interval of its history through a thematized reading of its contents. The only requirement was that all group members were proficient in the language of the chosen magazine.

Explorations cover from the 1920s to the 1970s, with special attention devoted to the years 1940s-1970s. This way, students can reflect on diverse, shifting approaches towards architecture publishing, questioning consolidated chronologies by introducing cross-readings and inquiring diverse geographies. These premises contribute to add new interpretative frameworks for the definition of more multifaceted and nuanced histories.

The collection embraces fifty periodicals traceable to diverse types and generations, selected in relation to their audience, network of "producers," and intellectual milieu. Chosen publications include several periodicals belonging to the cultural network of the new Departments of History and Theory between the late '60s and the '70s, such as the Yale-based *Perspecta*, the *AA Files*, *Oppositions*, or the Italian *Lotus*. Such magazines act as showcases of the diverse pedagogical projects and academic cultural positions, determining new relations between theory, history, and practice.

Also, the corpus of analyzed journals comprises neoavant-gardist publications. Often self-produced by students' collectives, they embodied the values of a precise historical moment and referred to individual architects, groups (*Archigram*), specific cultural positions, and counterculture groups (*In+*, *Marcatré*). The project looks at the echo of these independent publications and their editorial cultures in the established journals of the same years (such as *AD*, the *Casabella* of Mendini, the *Architecture d'Aujourd'Hui* of André Bloc, or Hans Hollein's *Bau*).

Besides, it looks mainly at the flourishing corpus of post-war professional, commercial, and trade magazines, where criticism became secondary to increasingly influential commercial and technical aspects. This trend became visible, especially in the North American context, with the editorial strategies of *Architectural Record* and *Architectural Forum*. Cultural projects pursued by other journals like *Progressive Architecture* and *Arts&Architecture* instead contributed to the formation of specific modes of communicating disciplinary discussions and representing architecture. Also, students looked at the editorial projects of publications that successfully combined professional culture and criticism, such as *Casabella* or *Architectural Review*.

Selected journals also belong to specific professional and cultural environments, such as those affiliated with institutions and organizations. Some examples include the reviews produced as the official platforms of the institutes of architects or the bulletins of other professional associations, like the *Journal of the American Institute of Architects* and *Architecture in Australia*, edited by the Royal Australian Institute of Architects. Other examples were the journal of the Turkish Chamber of Architects, *Mimarlik*, the Iranian periodical *The Architect*, and the Argentinian *Revista de Arquitectura*, promoted by the Sociedad Central de Arquitectos y Centro Estudiante de Arquitectura. Their European counterparts were, for instance, the *Revista de Arquitectura y Urbanismo*, promoted by the Madrid professional institute of architects (the COAM), or the journal of its Catalan equivalent (the COACB) entitled *Cuadernos de Arquitectura*, and the *British Official Architect and Planning Review*, or again *Urbanistica. Rivista bimestrale dell'INU*. The project considers also engaged publications which served as echo chambers for political associations, such as the Italian *Architettura - Sindacato Nazionale Fascista Architetti*, the Spanish *Hogar y Arquitectura. Revista bimestral de la obra sindacal del hogar*, and the journal of the Union of Hungarian Construction Workers *Epites-Epiteszet*. Others, such as the Indian *Marg. Magazine for the Arts* or the Polish *Projekt*, fostered the collaboration between cultural network encouraging the interactions between architects and artistic networks.

Methodologies and tasks

In the previous editions of the course, the research work was free of deadlines, with just two main intermediate submissions. However, the virtual condition asked for a subdivision in more phases, "tasks", where students had to circulate and discuss their working material every two weeks to maintain a lively exchange. Besides, groups could use dedicated virtual rooms as meeting places to discuss and revise their work with the Professor and the teaching assistants, while collective presentations and discussions were held in the main classroom.

The research exercise shifts from quantitative to qualitative analyses. It begins by investigating the DNA of the journals and sketching their identities, writing "journal biographies." Intending periodicals as complex projects, students problematized the cultural milieu and agenda architecture magazines, decoding all levels of the cultural, visual, financial, political dimensions underlying their construction process.

After outlining a reference bibliography and a synthetic introduction to the journal and its history (Task 1), students were asked to select a specific and relevant period of its publication, framing it in a broader historical, political, economic, and cultural context. They observed the evolution of the journal's editorial project over a decade, looking through the colophon at the composition of the editorial board and its involvement in the magazine's production, questioning caesuras and moments of change (Task 2), but also understanding the journal's circulation, financial system and distribution over the period.
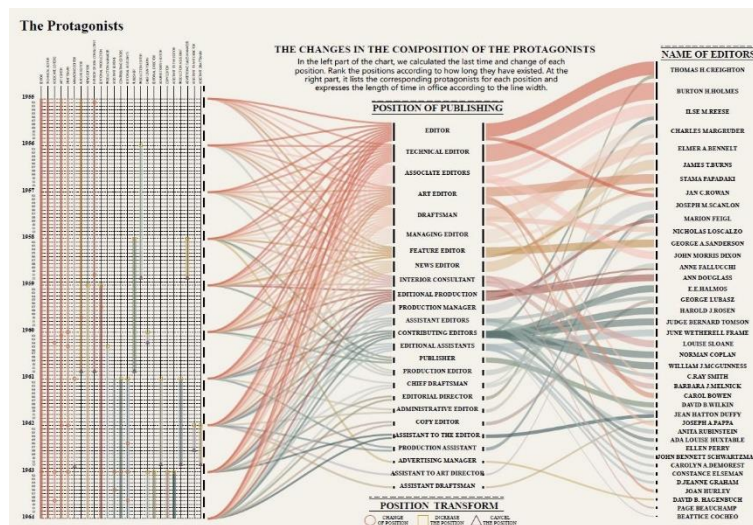
Figure 2. Analysis of the colophon of P/A Progressive Architecture, USA, 1955-65

Students then collected covers and tables of contents, sharing them with the class as a possible starting point for collective reasoning. Questioning both graphic identities and editorial strategies implies analyzing the use of images, advertisements, and covers in their shifting relationships with the written text. On the other hand, it also means addressing the structure, role, and relevance of the specific sections of the magazines and the overall structure of the issues. Students highlighted production processes, visual composition, and internal layout, underscoring recurring thematic sections and types of articles. These reflections delineate specific cultural and aesthetic projects linked to the interests of the editorial board and its members' engagement. The research addresses project reviews and critical statements, also highlighting the relevance of "marginal parts" like international press reviews, book reviews, technical sections, or thematic columns. These secondary, less-central domains constitute

meaningful platforms for the disciplinary debate to achieve a broad, more comprehensive understanding of the journal (Task 3).

Figure 3. Collection of covers from the Journal of the American Institute of Architects, USA, 1960-63

The DNA of the magazine also comprised the observation of the diverse article types and the mapping of relevant and recurring themes, according to three major criteria: areas of interest, topics, and project types (Task 4). A detailed excel grid listing all the visual and textual contributions helped to decode the journal and formulate transversal and comparative readings, highlighting the recurrence of people, places, and discourses also thanks to the possibility of questioning the shared built database.

Figure 4. Covers content analysis: P/A Progressive Architecture, USA, 1955-65

This survey was instrumental to the second phase of the work, a thematic examination addressing specific aspects of the journals recognized as particularly relevant in the first phase of the work. These ranged from themes to project typologies, from sections to iconographic material (advertising, photography, technical drawings, cartoons). The thematic repository of articles and images, in fact, identifies, selects, and places in dialogue contributions that apply to the proposed thematic reflection. Overall, this step, based on the construction of a thematic anthology of the relevant contributions on the pages of the analyzed magazine, often encourages reflections on the codification and circulation of models, references, discourses, and on their vectors. The result is the draft of a synthetic essay tracing methodologies, choices, and giving a complete picture of the research process and its results (Tasks 5-7).

Figure 5. Synthesis per topic and field of the thematic anthology of articles of Arts & Architecture, USA, 1956-67

Figure 6. A booklet produced as final result of the research work

Figure 7. Collage of a selection of the covers of the final booklets produced by the students

Representation, visualization, mapping as research and teaching tools

Before the writing of the final essay, a crucial phase of the research exercise comprised the production of thematic visualizations of the collected data (Task 8) to communicate the research through engaging quantitative and qualitative graphic syntheses. Visualizations adopted multilayered timelines, pie charts, histograms, maps, clouds, meta-clouds, and infographics to summarize and communicate the research results. Admittedly, this phase experimented with a set of less conventional narratives, languages, and devices within the teaching and study of architectural history.

Mapping operations help indeed identify shifting forms, seasons and epicenters[13] of the cultural and professional discourse, documenting the ever-evolving attention towards specific geographies, figures, vectors, and topics and highlighting professional trajectories and networks. Thematic cartographies and interpretative maps show the distribution and the circulation of projects, editors, authors, professionals, publications, concepts, discourses, and terms in time and space.

Such syntheses often reveal unknown channels, networks, and exchange occasions linked to influential personalities and allow to question the common understanding of the history of certain magazines often investigated and associated with the cultural position of dominant figures only. By disclosing processes of production, circulation, and appropriation of disciplinary knowledge in diverse cultural and linguistic areas, they prompt discussion on consolidated periodization and dominant narratives of 20th-century architecture history.

Figure 8. Narrating transnational and global visions of architecture history: Marg, India, 1946-55

DIGITAL HUMANITIES IN THE TEACHING OF ARCHITECTURAL HISTORY

The transition to digital tools, forced by the pandemic, boosted the development and testing of a methodological protocol using the tools of digital humanities to explore architecture journals and support research and teaching. This aim, pursued since the beginning of the pedagogical project[14], encompasses the design, production, processing and management of databases, digitization and reworking of documents, data analysis, data mining, mapping and 3D renderings, and the production of outputs.

Through dedicated practical lessons offered in the framework of the course, specific skills in the creation, use and development of IT tools and techniques are proposed to the students, opening to a shared understanding of the potentialities for technological skills and critical perspectives resulting from the intersection between the IT field and the human and social sciences.

By extrapolating and processing articulated data sets that can be read in their interrelationships, it will be possible to show the potential of cross-readings and comparative analyses that allow investigating from a critical and interpretative point of view the circulation and the fortune of discourses, actors, and models, as well as to analyze the magazines in their graphic and material dimension. The results can be communicated by using digital tools that enable the creation of effective visualizations in teaching and research.

 Furthermore, the tools of digital humanities could contribute to the critical discourse on architectural history and theory. The exploration of the relationships between established research and innovative experiences in digital data analysis, information technologies, representation science, and computational linguistic[15] incites a wider and more structured quantitative and qualitative[16] reading of specialized journals as a source for research and material for teaching. A hybrid analytical method in the contamination between historical research and multidisciplinary and innovative forms of narration and representation aims at establishing new interdisciplinary expertise able to offer new narratives accessible to a wider audience. Also, it could accelerate the development of a reference system for comparative studies, still unexplored both in terms of historical studies and architectural research[17] and provide additional working methodologies that allow us to deal with different types of content and cultural projects with appropriate and specific IT tools.

CONCLUSION

This pedagogical experience, based on the use of architectural periodicals as teaching tools and fostered through online teaching, challenged traditional forms of teaching, communicating, and researching architecture history and theory. The graphic syntheses and mappings produced could indeed constitute an added layer to the narrative devices used by the canonical histories of architecture.

The methodology promotes interest in a transnational and comparative vision of the history and theory of architecture. It overcomes monographic or localistic readings of journals in favor of cross-referenced and interrelated reflections, taking advantage of the international composition of the online class and the students' interests for – and access to – under-explored sources to be connected, crossed and exchanged. The project investigates the transnational dimension of the processes of production, reception, contamination and discussion of architectural and urban culture in their material and theoretical forms throughout the twentieth century, offering a new ground to reflect on its modes and for the creation of a critical position.

Also, it underscores the potential for further contaminations with digital humanities to improve data representation to support research and teaching of architecture history. As a matter of fact, tools and models of digital humanities are more and more explored in relation to the built heritage both at the architectural and urban scale. Yet, they are rarely applied to the inquiry of theoretical debates and discourses of architecture history. This program instead critically contributes to the ongoing discussion on digital architecture history and theory, opening to a replacement of the "history of architects" by the "history for architects".

NOTES

[1] Recent works on the relationship between architecture and media include, among others, Richard Wittman, *Architecture, Print Culture, and the Public Sphere in Eighteenth-Century France* (New York-London: Routledge, 2007); Shundana Yusaf, *Broadcasting Buildings: Architecture on the Wireless, 1927-1945* (Cambridge: The MIT Press, 2014); Mari Hvattum and Anne Hultzsch, eds., *The Printed and the Built. Architecture, Print Culture and Public Debate in the Nineteenth Century* (New York: Bloomsbury Visual Arts, 2018); Léa-Catherine Szacka and Véronique Patteeuw, eds., *Mediated Messages: Periodicals, Exhibitions and the Shaping of Postmodern Architecture* (New York: Bloomsbury Academic, 2018).

[2] Interesting results of this line of research discuss the canonical notions of representation and space examining them from the perspective of power relations, applying methodologies derived from cultural studies. Among others, see Hélène Lipstadt and Harvey Mendelsohn, "Architectes et ingénieur dans la presse: polémique, débat, conflit", in *Rapport de recherche 0120/80* (Institut d'études et de recherches architecturales et urbaines IERAU, Comité de la recherche et du développement en architecture CORDA, 1980); Lipstadt Hélène, "Nascita della rivista di architettura: architetti, ingegneri e lo spazio del testo (1800-1810)", in Paolo Morachiello and Georges Teyssot, eds., *Le Macchine imperfette. Architettura, Programma, Istituzioni, nel XIX Secolo* (Roma: Officina, 1980), 364-376; Beatriz Colomina and Joan Ockman, eds., *Architectureproduction* (New York: Princeton Architectural Press, 1988); Hélène Lipstadt, "Architecture and Its Image: Notes Towards the Definition of Architectural Publication", *Architectural Design*, Vol.59, no. 3/4 (1989): 13-23; Hélène Lipstadt, "Architectural publications, competitions, and exhibitions", in *Architecture and its Image: Four Centuries of Architectural Representation: Works from the Collection of the Canadian Centre for Architecture*, ed. Eve Blau, Edward Kaufman, and Robin Evans (Montreal-Cambridge: Centre Canadien d'Architecture-MIT Press, 1989), 109-137; Jennifer Bloomer, *Architecture and the Text: The (s)Crypts of Joyce and Piranesi* (New Haven: Yale University Press, 1993); Beatriz Colomina, *Privacy and Publicity: Modern Architecture as Mass Media* (Cambridge: MIT Press, 1994); Kester Rattenbury, *This Is Not Architecture: Media Constructions* (London-New York: Routledge, 2002).

[3] Among the studies focusing on specific journal types or particular seasons of specialized editorial culture, there are: Jacques Gubler, ed., *Rassegna: Architettura nelle Riviste d'Avangaurdia/Architecture in the Avant-Garde Magazines* no. 12 (1982); Hélène Jannière, *Politiques Éditorials et Architecture Moderne: L'emergence des Nouvelles Revues en France et en Italie, 1923-1939* (Paris: Editions Arguments, 2002); Beatriz Colomina and Craig Buckley, eds., *Clip Stamp Fold: The Radical Architecture of Little Magazines 196X to 197X* (Barcelona: Actar, 2010); Torsten Schmiedeknecht and Andrew Peckham, eds., *Modernism and the Professional Architecture Journal: Reporting, Editing and Reconstructing in Postwar Europe* (New York: Routledge, 2018).

[4] Among the first monographic studies are Jacques Gubler, *ABC 1924-1928: Avanguardia e Architettura Radicale* (Milano: Electa, 1983); Roberto Gabetti and Carlo Olmo, *Le Corbusier e L'Esprit Nouveau* (Torino: Einaudi, 1988); George Hartman, *Pencil Points Reader: Selected Readings from a Journal for the Drafting Room, 1920-1943* (Princeton: Princeton Architectural Press, 2004); David Travers, *Arts & Architecture 1945-49* (Köln: Taschen, 2004); Guido Canella and Maurizio Meriggi, *SA: Sovremennaja Arkhitektura, 1926-1930* (Bari: Dedalo, 2007); Chiara Baglione, *Casabella, 1928 - 2008: una rivista, molte storie* (Milano: Mondadori Electa, 2008); Jean Manuel Bonet and Antonio Pizza, eds., *A.C. La Revista del GATEPAC* (Madrid: Museo Reina Sofia, 2008); Federico Deambrosis, *Nuevas Visiones. Revistas, Editoriales, Arquitectura y Arte en Argentina de los Anos Cinquenta* (Buenos Aires, Ediciones Infinito, 2011); Maristella Casciato, "Scienza e arte dell'architettura: due riviste nell'india di Nehru", in *Las revistas de arquitectura (1900-1975): crónicas, manifiestos, propaganda*, eds. Beatriz Colomina, Juan José Lahuerta, Juan Otxotorena and others (Pamplona, 2012), 35-40; Jean-Louis Cohen, "Les Revues de l'Architecture Moderne: une Épopée de Papier", in *L'Equerre Réédition intégrale – The Complete Edition 1928 – 1939,* ed. Charlier Sébastien (Liège: Editions Fourre-Tout, 2012); José Parra-Martínez and John Crosse, "Editorial Policies and Politics of Design in the Pre-Case Study House Program Decade: The Visual Construction of California Arts & Architecture (193X–194X)", in *Graphic Imprints. The Influence of Representation and Ideation Tools in Architecture*, ed. Marcos L. Carlos (Cham: Springer, 2019), 657-671; Phoebus Ilias Panigyrakis, *Architectural Record 1942-1967 – Chapters from the History of an Architectural Magazine* (PhD diss., TU Delft, 2020).

[5] Among comparative volumes and collections see Alexis Sornin, Hélène Jannière and France Vanlaethem, *Architectural Periodicals in the 1960s and 1970s: Towards a Factual, Intellectual and Material History* (Montréal: IRHA - Institut De Recherche En Histoire De L'architecture, 2008); Beatriz Colomina and Craig Buckley, eds.,

Clip Stamp Fold: The Radical Architecture of Little Magazines 196X to 197X (Barcelona, Actar, 2010); Craig Buckley and Pollyanna Rhee, eds., *Architects' journeys: building, traveling, thinking* (New York: GSAPP Books / Pamplona: T6 Ediciones, 2011); Torsten Schmiedeknecht and Andrew Peckham, eds., *Modernism and the Professional Architecture Journal: Reporting, Editing and Reconstructing in Postwar Europe* (New York: Routledge, 2018).

[6] Concerning the international conferences, see "Congreso Internacional Las Revistas de Arquitectura (1900-1975), Crónicas, Manifiestos, Propaganda" (Pamplona, May 3-4, 2012, Escuela Técnica Superior de Arquitectura, Universidad de Navarra) resulting in the publication by Beatriz Colomina, Juan José Lahuerta, Juan Otxotorena and others, eds., *Las Revistas de Arquitectura (1900-1975): Crónicas, Manifiestos, Propaganda*. Conference Proceedings (Pamplona, 2012); the International Symposium "Exploring Digital Humanities. Mapping Visions, Discourses, Theories. Journals as Platform for Architecture and Urban Knowledge. A network of projects" (Milano, December 19, 2017, Politecnico di Milano). Active research projects are *ArchiteXt Mining. Arquitectura Moderna española a través de sus Textos (1939-1975)* (A. Esteban Maluenda), *Artnet_HRZZ* (L. Kolesnik), *Mapping Architectural Criticism* (H. Jannière), *The Sites of Discourse* (R. Figueiredo).

[7] The seminar has been held since 2015 in the framework of the curricular course of *History and Theory of Architecture* offered at the first year of the international Master in Architecture at the Politecnico di Milano by professor Gaia Caramellino.

[8] This methodological framework is introduced in Hélène Jannière and France Vanlaethem, "Architectural Magazines as Historical Source or Object? A Methodological Essay", in Alexis Sornin, Hélène Jannière and France Vanlaethem, eds., *Architectural Periodicals in the 1960s and 1970s: Towards a Factual, Intellectual and Material History* (Montréal. IRHA - Institut de Recherche en Histoire de l'Architecture, 2008), 41-61.

[9] Jacques Gubler, ed., *Rassegna: Architettura nelle Riviste d'Avangaurdia/Architecture in the Avant-Garde Magazines* no. 12 (1982); Alexis Sornin, Hélène Jannière and France Vanlaethem, *Architectural Periodicals in the 1960s and 1970s: Towards a Factual, Intellectual and Material History* (Montréal: IRHA - Institut De Recherche En Histoire De L'architecture, 2008).

[10] Argentina, Australia, Belgium, Brazil, China, France, Greece, Hungary, India, Iran, Italy, Mexico, Poland, Spain, Turkey, the United Kingdom, the United States, and Russia.

[11] While the rich collections of periodicals of the Libraries of the Politecnico di Milano and the Triennale provided an important source for the construction of the corpus, students crossed physical repositories of paper magazines and online library catalogs, archives, databases and collections of periodicals. Amongst others are the New York Public Library, the Bibliothèque de la Cité de l'architecture et du patrimoine/Bibliothèque nationale de France, the ACNP National Catalogue of Periodical Publications, the Emeroteca of the Biblioteca Nazionale Centrale di Roma, the RIBA British architectural library. Beyond using conventional search databases like Jstor and Avery Index, students connected physical and digital repositories from their sending institutions: amongst others, the digital collection of Spanish magazines implemented by the COAM, the ETH Zurich collection of German periodicals in "E-periodica", independent databases collecting digitized periodicals like "US Modernist" and "Delpher", the open websites of the Turkish periodicals *Arkitekt* and *Mimarlik* and the Brazilian *Acropole*. See also the Swiss project *Memoria della costruzione Svizzera online* (including the entire collections of *Das Werk / Werk-Archithese / Wek, Bauen und Wohnen*, *Tracés*, *Tec21*, *Schweizer Ingenieur und Architekt*).

[12] These perspectives focus on phenomena of transfer and export of design culture, but also on cultural hegemonies and the construction and sharing of imaginaries. They recently constituted an advanced frontier of historiographic research that unites a growing number of works. Depending on their specific angle, these studies use different terms to define their object: "transfer" (see Stanek and Avermaete, eds., "Cold War Transfer", 2012), "import" and "export" (see Cody, *Exporting*, 2002; Nasr and Volait, eds. *Urbanism Imported or Exported?*, 2003), "interferences" (Cohen and Frank, eds. *Interférences/Interferenzen* 2013), "dialogues" (Scrivano. *Building Transatlantic Italy*, 2013).

[13] Petra Ceferin and Cvetka Pozar eds., *Architectural Epicentres: Inventing Architecture, Intervening in Reality* (Ljubljana: Architecture Museum of Ljubljana, 2008).

[14] Pursuing the exploration of this methodological perspective, Gaia Caramellino and Nicole De Togni (teaching assistant of the seminar since 2015) organized with the colleague Ivo Covic the International Symposium *Exploring Digital Humanities. Mapping Visions, Discourses, Theories. Journals as Platform for Architecture and Urban Knowledge. A network of projects*, held at Politecnico di Milano in 2017. The symposium was intended as a first opportunity to explore different approaches to the study of architectural journals of the twentieth century as a source for historical research in relation to the application of methodologies typical of digital humanities for database management, data mapping, and the production of relevant outputs for research

and teaching. It aimed to identify and provide tools for research while contributing to structuring a critical discourse on the use of digital humanities in architecture.

[15] The diffusion of dedicated departments, research centers and institutes, in particular within the most important American academic institutions, is generating a variety of approaches in different disciplinary fields (Gardner and Musto, *The Digital* Humanities, 2015). If the research conducted by the Department of Languages at McGill University focuses on quantitative text analysis and methodological aspects related to its interpretation (Rockwell and Sinclair, *Hermeneutica*, 2016), at the Stanford Literary Lab computational criticism is applied to the study of literature, linking historical analysis with quantitative linguistics (Moretti, *Quantitative Formalism*, 2013).

[16] Some research centers privilege qualitative approaches, as in the case of experiments in semantic analysis initiated at Harvard's MetaLab or at the Stanford Center for Spatial and Textual Analysis (Schnapp, *Knowledge Design*, 2014).

[17] In addition to the previously mentioned International Symposium *Exploring Digital Humanities. Mapping Visions, Discourses, Theories. Journals as Platform for Architecture and Urban Knowledge. A network of projects*, see research projects as *ArchiteXt Mining. Arquitectura Moderna española a través de sus Textos* (1939-1975) (A. Esteban Maluenda), *Artnet_HRZZ* (L. Kolesnik) and *Mapping Architectural Criticism* (H. Jannière), *The Sites of Discourse* (R. Figueiredo).

WALKING AND DRAWING. OVERLAPPING TEACHING EXPERIENCES IN ARCHITECTURE

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INTRODUCTION

The practice of architecture is an ethical and responsible act that implies a rigorous and wide knowledge of the site of intervention and of the relationships between people and the built or natural environment where the construction is to be designed.

Besides other, more currently used, methodologies[1] in the teaching of architecture, the authors propose and promote in their curricular units[2] walking (walkscape) and drawing as investigating tools and instruments for the understanding and comprehension of the territory. The walk, sometimes a little errant and free, others more organized and rigorously oriented, allows the cognitive understanding of the territory, surpassing the knowledge of its physical, visible, and measurable dimensions. Drawing is used as a tool for investigation, research, analysis, and registry. In fact, when joined together, walking and drawing create a specific essential instrument of knowledge, not only intuitive, but also interpretive of the place. This specific instrument can produce new knowledge and innovation[3].

We have gathered some evidence that shows this joint methodological strategy has two advantages: on the one it allows the student to better consolidate his conceptual strategies and on the other hand, it allows the student to discover himself and his potential role within the territory.

THE TEACHING OF ARCHITECTURE

Both authors pose, continuously, the question of how one can teach better and how it is possible to expand the teaching of architecture in Évora's specific context and circumstances – a peripheral public architectural school in a World Heritage classified City, with a rich set of tangible and intangible heritage ranging from prehistory, to Roman and Muslim influence, to sixtieth, seventieth and eightieth century architecture and twentieth century contemporary architecture by Álvaro Siza Vieira, one of the most well-known Portuguese architects, surrounded by a vast territory of sunny landscapes dotted with cork oaks and olive trees that withstand time – not secluded but within Europe and the world.

Álvaro Siza helps us to understand what an architect must be: "He was called an architect because he actively took part in solving the problem and did so because he felt that problems ought indeed to be solved, especially those involved in drafting a project: fostering and encouraging a growing body of

people devoting their time to responsibly thinking things through, without shunning his own responsibilities in the meanwhile. He took his cue from ideas garnered during the preliminary visit to the site, convinced that proper design cannot be deemed merely from pieces of information, but that, when applied to a give idea, information serves to tailor it and give it definition; convinced also that the idea lies in the «place» more than in the mind – for those that are capable of seeing – and hence it emerges at first sight; additional surveys by the architect or others are compiled with this first, and what began as something simple and linear becomes steadily more complex and closer to reality – something truly simple."[4]

The Architectural Design Studio

In the teaching of Architecture, the methodology traditionally used in Évora is still that of the «atelier», as illustrated in Figure 6, as a mythical space for the transmission of knowledge, influenced by the Beaux-Arts school of Paris - of the great master architect who transmits his knowledge to his apprentices - and by the Bauhaus - in the combination of practical and theoretical studies in exercises that simulate professional activity.

Figure 6. Architectural design class, evaluation, and critical session with guest from outside the University (@SSalema).

Within the studio the student reflects-in-action - reflecting on the making of architecture – as it is pointed out by Donald Schon[5], as a process of acquisition and construction of disciplinary knowledge implicit in the practice of architecture, as illustrated in Figure 6. The teaching of architecture goes much beyond the learning of disciplinary knowledge, and includes cognitive and philosophical knowledge, as well as that derived from epistemological research.

Based on the current architecture teaching matrix, the University of Évora, has introduced, in a pioneering way research by design and students are challenged to use the nearby territory (with both urban and natural high-quality assets) as a fundamental basis for defining a conceptual design strategy.

At the beginning of each term, teachers propose an initial study visit to the site / territory that is the object of the architectural exercise during which, in addition to looking at, photographing, and experiencing the place, they strongly promote walking and drawing as a tool for knowledge and understanding of the place.

The act of walking, as illustrated in Figure 7, allows the time and opportunity to collect relevant information from the territory that will be used to sustain each student's site choice and architectural program. Both context and circumstances anchor the architectural project that is developed as part of the landscape. These site visits are accompanied by the teachers, and each student is expected to register the site and his analysis about it. Orientation, landscape values, views, and site details, amongst others personal values and appreciations, constitute a specific context and circumstance that will define each architectural project.

Drawing is encouraged to register what is observed, to comprehend and communicate what is relevant.

This outdoor activity has also been used due to the current pandemic context, despite and, perhaps, due to it, as an additional strategy to take the students out of the classroom and to balance the eminently digital methodologies that have been so much strengthened. By inducing slow walking, as Álvaro Siza[6] does at Malagueira, and nature appreciation as well as non-technical and non-digital drawing students explore the act of observing and understanding of the territory.

Figure 7. Walking with students on the Faro salt pans as part of the salt baths exercise (@SSalema).

Back in the studio, the teachers, in a workshop context, promote the creation of graphic atlas, either in group or individually, as illustrated in Figure 8, where the various records made during the walk are articulated. The atlas is a reading and analysis device under construction, allowing for meaningful and/or disruptive narratives. The reading, reflection and interpretation of these personal atlases allow for revisiting and generating knowledge.

Figure 8. Wall Atlas of a student after visiting Malagueira (@PGuilherme).

Drawing

Drawing, besides other verbal forms, is the architect's primary non-verbal tool. The recognition of drawing as the fundamental basis of design research is naturally linked to the importance of the project's primordial idea – the first sketch – and to the communication of the architectural idea – utopia.

In the teaching of Architectural Drawing, students are challenged to use drawing as an instrument of observation, interpretation, and research tool in / by / through the comprehension of the site/territory and to explore and test an architectural idea. Drawing promotes the reading of the territory by identifying the various systems that are in place, allowing for example: the geographical, morphological, hydrographic and/or architectural record of that territory. It is a synthetic procedure by selecting what is relevant.

Figure 9. Walking and drawing the city as part of the get to know Évora exercise (@Pguilherme)

During some drawing exercises, as illustrated in Figure 9, students follow a specific urban path of a site and have to quickly draw what is relevant in each stop they make, The objective is to strengthen the quick reading of a site and quickly draw and register what is relevant. Each student can define his own individual strategy of looking, seeing and registering, with the critical supervision of the teacher.

By the end of the exercise each student will have a narrative set of drawings that communicate his understanding of the site.

Drawing exercises include observation skills, mapping, cataloguing, and stimulates an anticipatory practice that allows to see, interpret, and represent the different realities that the student faces.

The record, through drawing, is assumed as an essential, poetic, and critical act of analysis and selection of what is relevant, of discrimination of what is essential and of the characterizing elements of the space travelled.

Walking (Walkscape)

As advocated by Francesco Careri at Walkscapes[7], walking is not only an aesthetic practice, but a practice that stimulates students to get to know the space, the territory, and the landscape. Walking is therefore understood by us as a critical tool for looking at and observing the landscape, creating a mental image, as well as an emerging strategy for thinking about architecture.
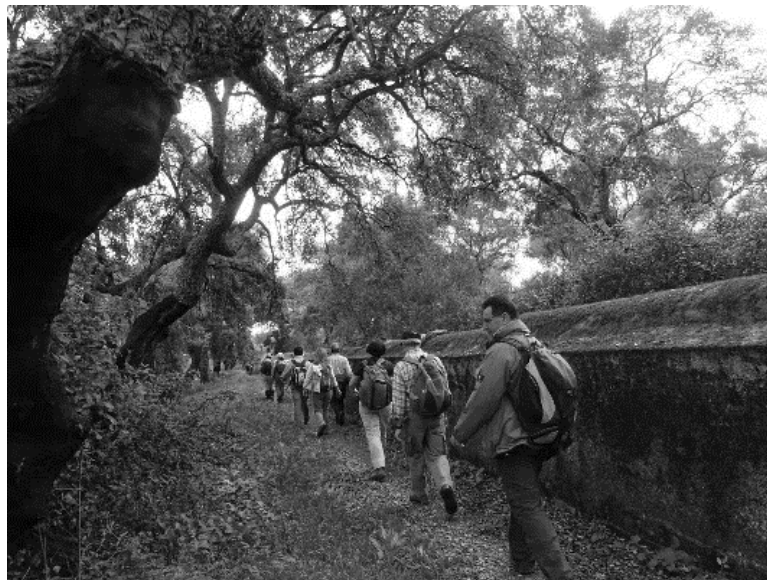
Figure 10. A walk along the Água da Prata Aqueduct, carried out as part of the "the house and the tree" exercise (@SSalema)

Analogies can be made between walking and travelling - from the "Grand Tour" to study tours – and how architects have used architectural or summer tours as a learning opportunity for gathering more knowledge, allowing sensory approach to unexperienced build spaces, and referencing history as a design tool. A common example is the trip Álvaro Siza, Alexandre Alves Costa, Sérgio Fernandez, José Grade, Alcino Soutinho and Fernando Távora's did to Greece in 1976. "When you really travel, your eyes and through them your mind, take on an unsuspected power."[8]

The walk, somewhat wandering and free, allows for a cognitive understanding of the territory, going beyond the knowledge of its physical, visible, and measurable dimensions[9]. Walking allows students an intuitive and analytical knowledge of the territory that proactively stimulates them to identify a specific place and to build a relevant and innovative program capable of intensively and/or poetically transforming the place. Walking is also a form of appropriation that includes a personal relationship between man and the natural or humanized space he walks through. Throughout the walk, the understanding of territory changes and transforms.

With this strategy of walking and drawing, as presented by Papanicolaou[10], students are stimulated and enabled to investigate the inherent potentialities of the territory under study.

THE STRATEGY

We implement this exploratory strategy following Álvaro Siza's design process and research in architecture taking into consideration his visits and conceptual sketches of Malagueira[11]. In his first visit in March 1977, after the meeting with the client (town hall), Álvaro Siza, as illustrated in Figure 15, walked to the site and drew along the path the people, the context, and the circumstances of the agricultural farm of Malagueira that would constitute the site where he would build the project of 1200 dwellings, public buildings, and urban space. As we can observe is his first sketchbook[12] he spent some time walking to Malagueira and drew some of the conceptual ideas that would be kept during the whole project, like the relation with the Historic Center or the water courses and the parallel lining of dwellings.

Figure 11. Álvaro Siza Vieira drawing near the Malagueira's windmills, March 1977 (@DM)

Along the way he recorded the spaces he walked through in drawing to discover the potentialities of the project, beginning the systematic recording of his thinking process through drawing.
As Álvaro Siza said in 1987: "Drawing is a form of communication with oneself or with others. For the architect it is also, amongst many other things, a working tool, a way of learning, understanding, communicating, transforming; a way of designing."[13]
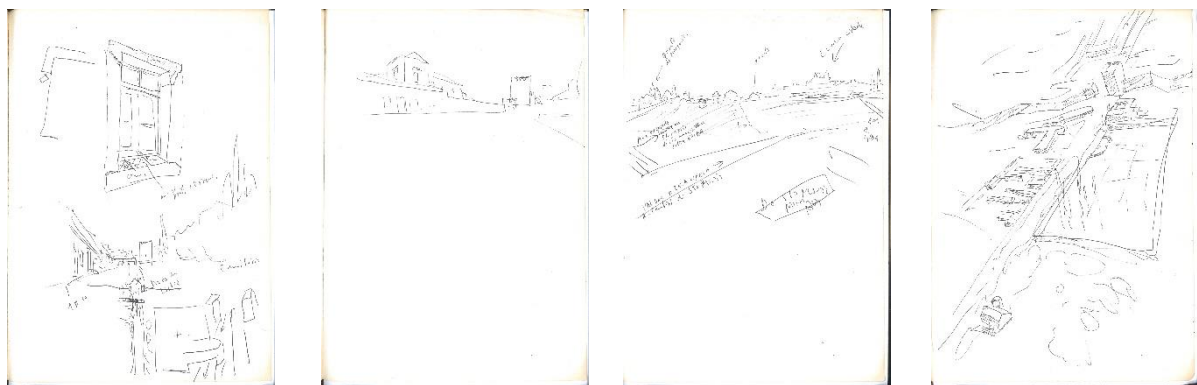

Figure 12. Álvaro Siza Vieira, drawings from Malagueira, Sketchbook 1, pp.10, 13, 14, 18 and 40, March 1977 (@DM)

We believe that more common pedagogical strategies developed in the design discipline can be complemented with these practices that stimulate a better understanding and apprehension of the space that surrounds us in the direct relationship with the natural or humanized object of study

The walk and the observation drawing imply stopping, they invite one to look, listen, hear, write, photograph, collect, identify, and thus build a prepositional narrative related to that place...

The critical experimentation of the built or natural space is an essential factor in learning architecture - Living, feeling, touching, measuring with one's body is one of the ways to knowing the space, the architecture, the territory.

CASE STUDIES

This strategy has produced very interesting results that can be observed in the extraordinary work students have produced in their master thesis. Several students follow this methodology, and many have been awarded prizes[14] and nominations due to their connection to the context and to the site.

Case Study 01

The first example is the research work of Gabriel Oliveira[15,16,17] in his dissertation, as illustrated in Figure 13, about the Water Mills do Almansor at Montemor-o-Novo, where walking and drawing are an integral and fundamental part of the research process.

The preparation of the fieldwork began with the identification and referencing of all the objects within the territory object of study. Gabriel Oliveira walked along the river to draw, to describe and understand the landscape and geography. He complemented and contextualized these structures on the banks of the river and defined a critical approach to their value and safeguard.

He used different types of hand drawings – sketches, models, metric surveys, diagrams – to select, organize, and differentiate the spatial positions and distance relations of each water mill within the main river. He designed a correspondence between language (visual and graphic) and system (relational) to produce new knowledge about these forgotten spaces. Drawing was used as a process of knowledge and interpretation, which allowed the development and consolidation of a preceptive, cognitive, and synthesis ability. It was a methodic and cyclical process, following the path of the river, observing its essential moments, focused on creating a catalog of the whole and of its parts in relation to the territory.

Drawing was also a process for understanding not only the site structure, but also the engines and the mechanics behind the hydraulic systems as well as the technological mechanisms of the grinding systems, always using visual information. This effort implies that drawing is done in stages, from the general to the particular in a logic of orderly interpretation of reality.

Drawing constituted the strategy for ordering references and establishing criteria of choice to organize the complexity of the preceptive and visual data.

This condition was for the student a moment of extraordinary complexity and difficulty. To represent graphically is both action and knowledge.
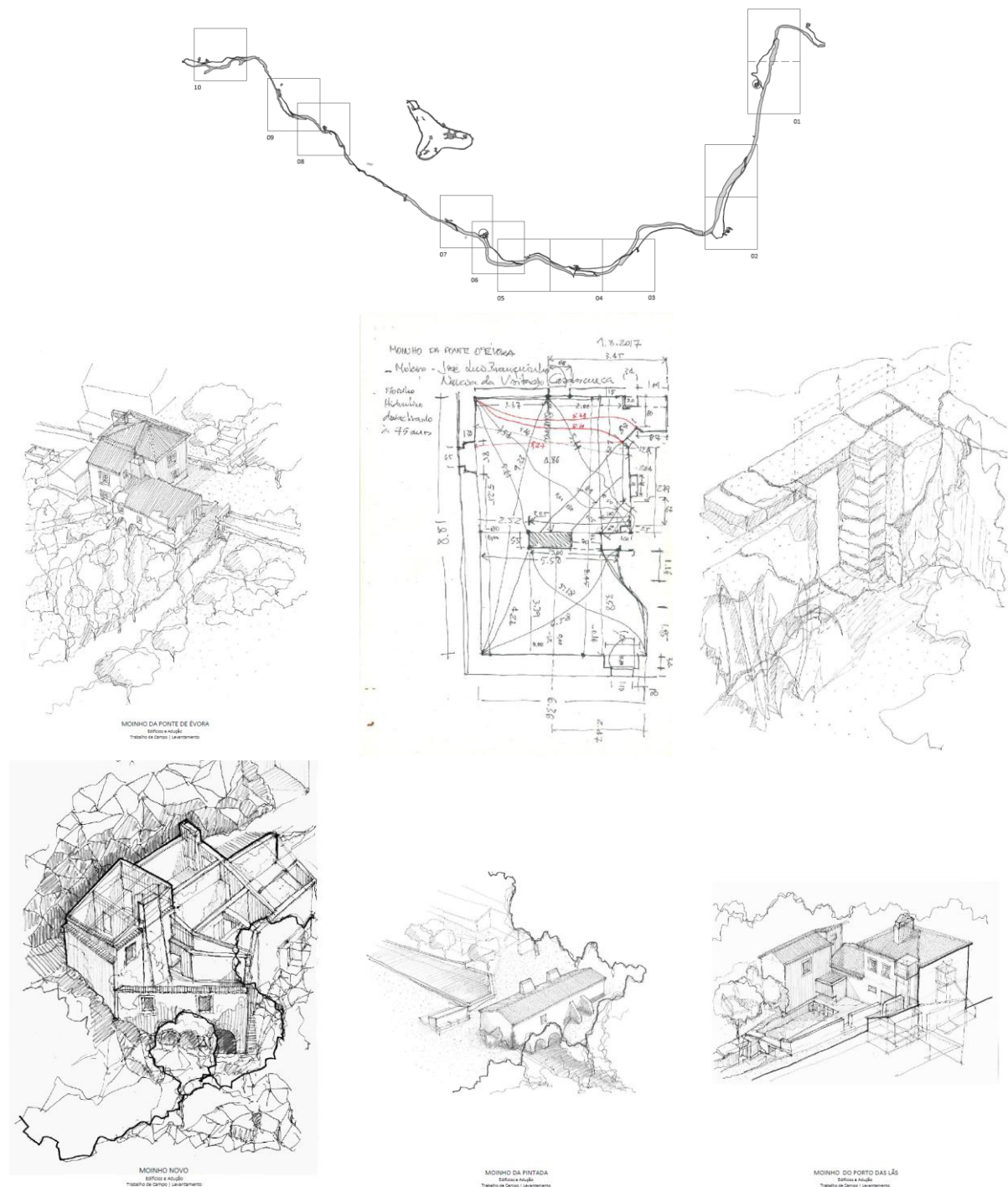
Figure 13. Drawing as the process of landscape recognition near the Almansor River - MA Dissertation by Gabriel Oliveira (@GOliveira)

A drawing that is a way of knowing what you see.

Case Study 02

Another example is the dissertation by Sylvie Claro[18,19,20], as illustrated in Figure 13, with a proposal for the ancient Aqueduct of Évora. As she points out walking was the strategy used systematically by

Sylvie, as an instrument of knowledge, of reflection, and as a tool capable of suggesting a prepositive action on the territory. Walking was fundamental for the identification of potential situations of intervention / for the design of small complementary equipment.

Figure 14. Intervention proposals along the Aqueduct path by Sylvie Claro (@SClaro)

The walk also assumes the value of the route and the heritage value of this monument that should be enjoyed by the population in the proposed 4 new spaces: the belvedere; the bath; the shelter, the tower.

CONCLUSION

By joining both – walking and drawing – a "new" methodological common exploratory strategy is set in motion to understand and comprehend the territory where the student works. This understanding is critical for architectural thinking and for the initial conceptual work. Throughout the development of the exercises in the architectural studio the student is asked to anchor his work within the context and the circumstances of the site based upon its initial observed nature. This anchorage to the site characterizes the structure of the Évora's master degree and unites both teachers and students to the uniqueness of each architectural response.

The results of this reflective and methodological practice have been interesting and promising. The use of these strategies by the students has shown a direct relationship with the quality of the results

obtained. The individual and collective discovery of the value of the territory builds and develops essential skills for the architectural professional practice.

As Álvaro Siza Vieira states in 1978, "I have always taken care to "look at the site" and make a drawing before calculating the square meters of area to be built" (Siza, 1997, p.23). The walk and the drawing manifest themselves as indispensable instruments of reflection, reading, interpretation and representation of the characteristics of the territory during the students' investigative process. The drawings allowed not only to record the identity of the place / territory, but also, describe the themes of reading and investigation of the territory from the characterization of various systems that codify it.

In addition, drawing is also closely linked to the development of the concept of idea, as a functional and conceptual condition in architecture. This process of thinking architecture through drawing is an inspiring characteristic in Álvaro Siza Vieira that has served us as a standard of how we can understand the landscape, either urban or natural, and the relevance of this reading to anchor the project.

We sustain that walking and drawing are two activities that correlate with the understanding of the natural and built territory and intensify the knowledge and research for the project

In Álvaro Siza's sketchbooks of Malagueira there are drawing that contains an Angelus Novus, as illustrated in Figure 15, following Walter Benjamin's allegory, looking to the past while facing the wind of the future. From the visit to the place and the drawings emerged the different proposals of the project and the strategies of Malagueira's relationship with the historical city.

Figure 15. Álvaro Siza, angels and men with Évora in the background, Sketchbook 9, p.10, October 1977 @DM).

Architectural Research highlights this unique ability to look by walking and to stop by drawing as a tool to understand what surrounds us, as a fundamental basis for the foundational act of designing.

CREDITS

NOTES

[1] Stefan Kurath et al., *Handbook of Methods for Architecture and Urban Design*, 1st English edition (Zürich: Triest Verlag, 2018).

[2] Pedro Guilherme teaches Architectural Design and Sofia Salema teaches Design Project, both during the third year (1st Cycle), at the Architectural master's degree (3+2 years) at the University of Évora.

[3] Filipa Roseta, ed., *O Que é Inovação Em Arquitectura? =: What Is Innovation in Architecture?* (Casal de Cambra, Portugal: Caleidoscópio, 2016).

[4] Álvaro Siza and Antonio Angelillo, *Álvaro Siza : Writings on Architecture* (Milan; London: Skira ; distributed by Thames & Hudson, 1997), 175–77.

[5] Donald A Schön, *The Reflective Practitioner: How Professionals Think in Action* (Aldershot: Ashgate, 2003).

[6] Álvaro Siza Vieira, *Imaginar a evidência* (Lisboa: Ed. 70, 2000).

[7] Francesco Careri and Frederico Bonaldo, *Walkscapes: O Caminhar Como Prática Estética* (Barcelona: Editora Gustavo Gili, 2013).

[8] Siza and Angelillo, *Alvaro Siza*, 113.

[9] Geoff Nicholson, *The Lost Art of Walking: The History, Science, Philosophy, and Literature of Pedestrianism*, 2009.

[10] Stella Sofia Papanicolaou, 'Students of Architecture Develop Counter-Strategies for Spatial Transformation Through Walking and Mapping' (ArchTheo'16X.Conference, Istambul, 2016), 11; Stella Sofia Papanicolaou, 'Walking and Mapping as Craft in Architecture', *South African Journal of Art History* 32, no. 2 (2017): 13.

[11] Pedro Guilherme and Sofia Salema are both principal investigators of the Research Project "MALAGUEIRA: HERITAGE FOR ALL" (PTDC/ART-DAQ/32111/2017). In this research we have gathered evidence that Álvaro Siza Vieira research process includes walking and drawing as a way to grasp the context and the circumstances of the site. It is possible to observe in a joint analysis of the sketchbooks the induction and deduction process as the project progresses and gets more detailed. This constitutes a research in the project using drawing as a research tool. More information about the research project is available at https://www.investigar.uevora.pt/investigacao/projetos/projetos_em_curso/(id)/3827. This research is financed by national funds through FCT - Foundation for Science and Technology, I.P., within the scope of the research project MALAGUEIRA - PATRIMÓNIO DE TODOS, Ref.ª PTDC 2017 – PTDC/ART-DAQ/32111/2017 [UI&D: CHAIA/UÉ – Ref.ª UID/EAT/00112/2020 – FCT] Hosted At CHAIA/IIFA/UE.

[12] At that time, he starts to use a specific black soft cover A4 notebook with 80 plain white sheets to keep track of his project conceptual ideas and to keep track of their changes.

[13] Siza and Angelillo, *Alvaro Siza*, 17.

[14] More Information about prizes obtained by Évora students is available at ARCHI PRIX (http://www.archiprix.org/2021/). ARCHIPIX 2020 - Winner | Vencedor Pedro Brito; Mentions: André Lestre; João Bilou; Sylvie Claro. Also at Trineal de Lisboa Students Competition prizes - Mentions: Carolina Dias e Cristina Silva

[15] Gabriel António Barrenho de Oliveira, 'Moinhos do Almansor em Montemor-o-Novo: levantamento e interpretação arquitetónica de um património esquecido, como contributo para a sua salvaguarda' (Master Thesis, Évora, Universidade de Évora, 2020), http://hdl.handle.net/10174/28151

[16] Gabriel António Barrenho de Oliveira, 'Moinhos do Almansor em Montemor-o-Novo: levantamento e interpretação arquitetónica de um património esquecido, como contributo para a sua salvaguarda' (Master Thesis, Évora, Universidade de Évora, 2020), http://hdl.handle.net/10174/28151.

[17] Supervised by professors Sofia Salema and João Matos.

[18] 'Aquae Ducto: proposta de percurso para a Água de Prata' (Master Thesis, Universidade de Évora, 2019), http://hdl.handle.net/10174/25539.

[19] Abstract: Aquae duct - means driven water. The Água da Prata Aqueduct, as an infrastructure that conduces the water and the environmental walk to it associated, constitutes the study object of this work. The present project work pretends to describe, analyze, and respond to difficulties presented by the actual environmental itinerary to the walker. Different possibilities and alternatives are proposed to go through this course associating spaces and small appointments located all along the territory. These represent transitional moments for the walker and complete the path assuming a ludic and functional character to meet the needs felt during the reconnaissance held on the territory. During the study and analysis of the county, Évora's city and the Àgua da Prata Aqueduct, walks were held along the way as a fundamental knowledge instrument and methodological tool of recognition and validation of new project hypothesis. Pictures and videos were taken from the aqueduct and its relationship with the territory and the city as a process record of methodological recognition and safeguard for the future. The projectual drawing got anchored at the singularities identified along the territory that justify the architectural and project options that complete the path experience.

[20] Supervised by Prof. Sofia Salema.

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SPACE FOR CREATIVITY: CREATIVE STUDIO WORK IN ARCHITECTURE AND BEYOND

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INTRODUCTION

In 2019 – after finishing my master's and before my doctoral status – I have started my research about architecture education with a hope of possible progress at our university. At that time, my goal was to show critical attitude towards outdated teaching methods and to inspire fellow students and teachers to concentrate on improvement and introduction of up-to-date topics. Just a few months later, Covid 19 gave a huge push, not only to architecture schools, but all types and fields of education around the world. We had to bridge over physical distancing by means of online platforms and overcome the lack of interactions and, many times, the lack of efficient ways of communication.

As a doctoral student and lecturer at Budapest University of Technology and Economics (BME) Covid19 provided a great challenge both in my studies and in teaching others. Being a multidisciplinary creative field the importance of studio work, drawing by personal corrections, touching building materials and experiencing space physically is unquestionable.

However, this challenge seemed like a great opportunity at the same time: everything had to be reorganised and thought trough, all subjects were transformed into virtual classes and thus they needed some rethinking. So, I took the initiative to start a research about architecture education, and in the framework of a first-year design class I started testing some ideas as a leading consultant at the same time, to put my research into practice.

The idea and need for "Creativity"

Before deciding on the method, it was essential to define what creativity means when we talk about design studios and practices. Oftentimes in architecture and design education students get labeled, many times at the very beginning of their studies, based on their suspected talent. And, sadly, the "Talented" box seems to have no open access from outside, no crossover for those in the "Others" box. To overcome this approach was the first stride.

Based on my interview with Ádám Somlai-Fischer[1] – co-founder of Prezi and a former architect from BME – on his Erasmus exchange in Stockholm he experienced that profound and dedicated work was the key for every project in the semester: the more work put into understanding and defining, the better results they got. No one could succeed with a good idea if it lacked elaboration, but a huge pile of drawings would not be sufficient either without substance.

This approach connects to the work of Jeff and Stanley Degraff on *The Creative Mindset*, a book providing easy techniques for creating a creative workflow. They believe everyone can be creative

anywhere in space and time, it is not a matter of genius. Instead of putting creativity on a pedestal they encourage to see it as a skill that can be improved by practice and nurtured by equal treatment.

Based on these ideas "Creativity" could be described as an attitude and a state of mind in which we are highly capable of combining and restructuring existing knowledge, information, and experiences to create a new and unique connections or solutions. This includes every part in a design process and does not require a certain type of character or ability.

This process needs autonomous thinking and the opportunity of individual decisions. Based on my experiences as a former student of BME, our tasks were described by a list of necessary drawings and functions we had to incorporate in our design during the semester. Thus, students had little chance and practically no need to figure out the best way of presenting the ideas behind their concept, or even to think about the necessities of the place. Everyone focused on completing the requirements by making the great number of drawings, and surviving the all-nighters. Although a fix list of requirements creates an equal amount of work for every participant, it lacks the inspirational need for decision-making, which we tried to compensate with internal tasks and discussions during the last two semesters in our studio work.

CULTIVATION OF CREATIVITY
"The mind is not a vessel to be filled, but a fire to be kindled."[2]

Breeding Methodology
Trough the one-year period of my research I tried following the technique of plant breeding in terms of creating a good practice in design teaching. In case of plants the process is quite simple. Taking a type of red pepper as an example: one plant might have a particularly nice color while the other tastes much better than the rest. To combine these features, breeders mix the pollen of these two and use the seeds of them to grow a new plant obtaining both nice color and taste.
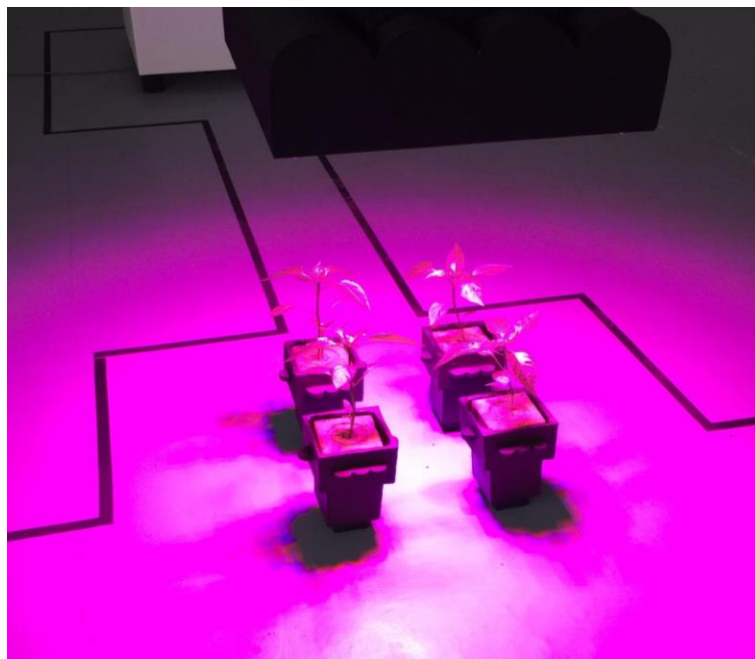
Figure 1. Not Quite California Wonder
Exhibition at Igor Metropol Art Space, Budapest, 2021[3]

Similarly to this procedure, I collected examples and ideas from interviews, papers and documented design courses, and synthetized a selection of their exercises in our classes. The base of this work was the first-year *Space Composition Studio*, the introductory design class of freshmen architect students, and the *Basics of Architecture* design class the following semester at the Faculty of Architecture in BME. The prior focuses on creating several objects, approximately 10 cm by 10 cm, to express the atmosphere and the space of a given topic. The latter introduces basic building design by the survey of a specific location, designing the concept of the function and finally creating individual solutions described in 1 to 100 scale.

Creativity Exercises - The Brief story of Dóra Maurer and Miklós Erdély

One of the most influential sources was the evoking of a neo-avant-garde workshop organized during 1975 and '76 in Hungary. The Creativity Exercises Studio by Dóra Maurer and Miklós Erdély was designed to give alternative tasks and generate creative workflow. They used mixed media, from drawing to photography or physical modelling and the combination of these, to create groupwork where the individualistic approach of art faded into the joy and problem-solving attitude of the students.

During 2014 and 2016 this work was evoked by a series of exhibitions internationally in current museums and galleries in Hungary, Germany, and Poland. As a result of these parallel exhibitions the curators of Tranzit art gallery[4] published a book in 2020[5], rethinking the ideas of Maurer and Erdély among other creative studios, in a contemporary context.

Figure 2. "The Stream-way of Truth"
pthoto of Miklós Erdély the co-leader of Creativity Exercises Workshop[6]

Space for Creativity

Based on their descriptions and the collection of the tasks from Creativity Exercises Workshop I transformed some of these tasks to architectural design for both physical and virtual platforms. To illustrate the idea, I would list a few examples from the original tasks which became the part of the above-mentioned subjects in an alternative way.

1. *Drawing by words*: the participants form pairs: one will be the "Drawer", the other is the "Instructor". The Instructor selects a random object in the room without telling the Drawer, and coordinates only the movement of the pencil in the Drawers hand, describing the angle and length of

the necessary lines to create the figure of the chosen object. The aim is to create a comparable copy of the article by words transformed into drawings.

The adaptation of this task helped us during the firs-semester Space Composition to inspire cooperation during the online period of the semester, when students needed much more encouragement for active participation during the classes and to share their ideas about each other's work. As a design task we asked the students to create a space repetition of one basic element, just like a brick forming a wall. To present their ideas they had to create couples and, without showing their basic building form, they described their ideas to each other in turns while the listener tried to draw it on a sheet of paper. After both students finished their explanations, we gathered in one group online and the listeners had to show their drawings based on the description and present the idea of their partners. Consequent to this class we experienced much higher activity of our students during the consultations, sharing their ideas about their own or others' work, and often helping each other to overcome dilemmas about design or visualization.

2. *Forming space with one piece of paper – create something unique:* the only rule in case of this task was the limit of the given A4 paper. The participants could apply folding or cutting on the given sheets, without using pencil, glue, or any other element to create an expressive form. This task is typically individual and focuses on the unique perception and the associations of each student.

Based on this task and using the idea of Rita Terbe, the former coordinator of Space Composition at the Faculty of Architecture and instructor at GYIK Workshop[7] for art, our students started most of their design by creating a so called "pop-up model" from a white A4 sheet, to illustrate their ideas. We used this task to create studies for spatial concepts as well as the expression of individual experiences of a building. As part of our course, we organized a visit to Ludwig Contemporary Art Museum[8] in MÜPA cultural hub[9] and asked each student to choose a part of the contemporary building and use their sheet to express this selected space element. After modelling they documented their work by photographing them along with the chosen building part. This task showed the perspective of the architect and, by constructing basic models of their experiences in a contemporary interior, students could understand the complexity of a structure while expressing their own approaches.

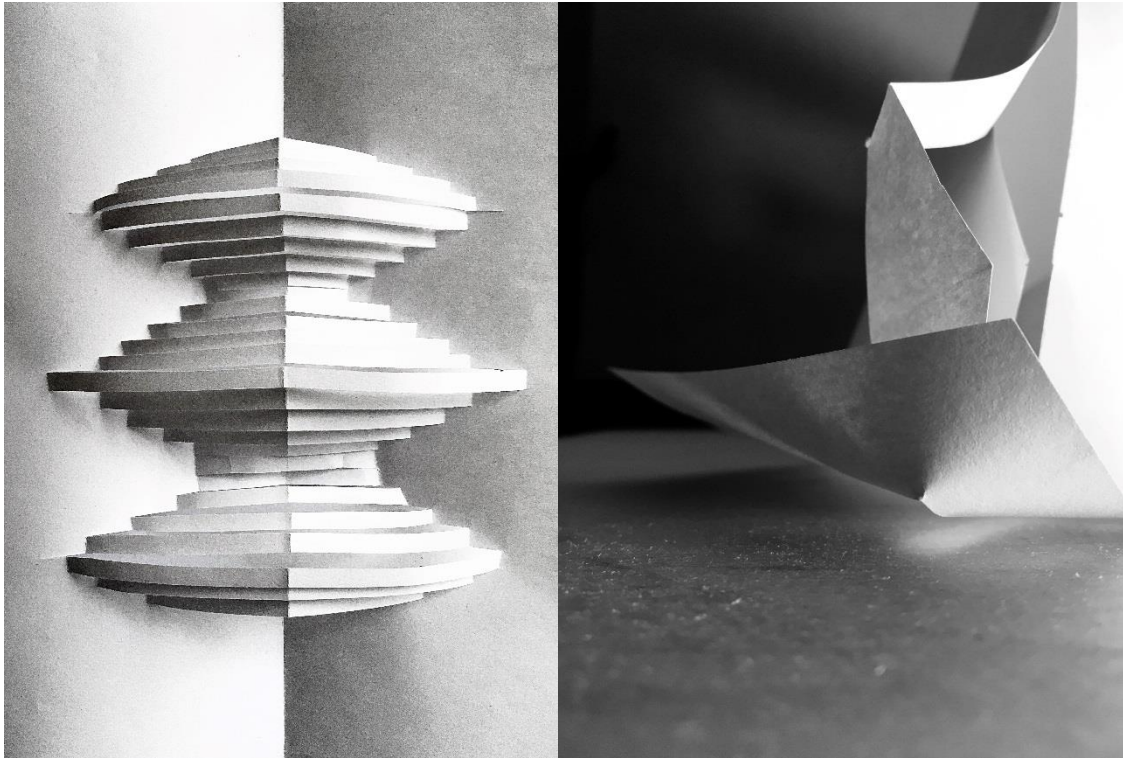*Figure 3, 4, 5. – Photographs of the studio work in MÜPA*

Figure 6 and 7. – Pop-up models by Borbála Szelle and Anna Borbála Nagy,
Space Composition Studio Work 2020.[10]

3. *Crossroads:* the editors of Creativity Exercises underline the specific approach to teaching that formed in the workshop by Maurer and Erdély. The combination and interaction of individual expression and collective workflow created a strong symbiosis between art and education to inspire creativity. The leaders of the workshops often invited artists from various fields to expand the horizon of possibilities and the variety of techniques used during their work. These collaborations inspired unprecedented forms of expression.

During the second semester in the frame of Basics of Architecture design studio I invited a contemporary painter, András Ferenc Pintér (PAF)[11] to join the design class for a short introductory task. During the quarantine we had a chance to experiment on expressive forms of architectural visualization, suitable for the first-year students' knowledge and the virtual presentations. To inspire free design and abstract ideas we introduced the students the utopistic Archigram magazine and asked them to create the visual presentation of a building parasite, that adds a spatial and functional improvement to a selected building. PAF asked the students to use an op-art piece as the background of their work and presented the work of painters and artists using strong, vibrant colors on a grayscale background. Each student had to choose a different building and a different background to create a digital collage for the presentation. During the class we used a common online board where everyone could pin and post their choices and reflect on the ideas. As a result, the group created an online collection of artistic drawings representing a their individual utopias.

Figure 8, 9 and 10. – Parasite Design by Viktória Kliszek, Dávid Wagner and Sára Márialigeti, Basics of Architecture Studio Work 2021.[12]

As a sequel of this task the concept of the final projects of the semester could be presented by a similar composition that shows the designed building in a more abstract form to underline the idea behind the design and the story of the place behind the technical details.

Apart from these, we aimed to encourage continuous work during both courses by constant improvement of the projects. Although each course included consequent tasks based on the progress of the semester, every piece made by our students could have been developed till the end of the semester. This constant improvement motivated our group to rethink their solutions, and to use the different skills or conceptualizing methods they learned throughout the whole semester. By returning to their ideas with a fresh eye, and by making several improvements, they practiced and made much more progress in modelling and drawing than what they would have gained from a closed task and a fix evaluation for an immature work during the course.

A POSSIBLE WAY TO CONTINUE

Although the presented tasks were created for two introductory subjects, I believe many of the exercises of Dóra Maurer and Miklós Erdély could be inspirational to all years of architecture and design studies. Although the pandemic hopefully comes to an end soon, and schools and students might have the possibility to return from quarantining, it is most likely that hybrid education will stay with us on the long run. By exploring creative ideas and adapting them to a mixed physical and virtual system it is possible to benefit from these changes and create a more up-to-date, inclusive way of teaching and cooperation.

Cooperation in a bigger scale

During this research I had the chance to collaborate with creative studios and other design schools to investigate for new ideas. As a result, apart from the collection of great ideas, came the unquestionable benefit of international collaboration that formed over the topic of creative teaching. Even though the pandemic generated physical distancing, I experienced an unprecedented openness for cooperation and information sharing among schools and professors, which inspired me to share these thoughts. The common saying *"We are all in this together"* marks a great opportunity for our institutions to learn from each other.

CONCLUSION

The rapid and profound changes required by the past years created a huge challenge for studio-based education in architecture. However, these challenges brought an opportunity to create an inspiring collaboration between different fields and various workshops, so that creative learning could continue in an open and collaborative way.

By adapting techniques from other disciplines and refreshing the ideas of alternative artistic workshops it is possible to inspire collaboration and creative thinking in virtual architecture education. This collaboration, and the continuous exchange of information may also ensure the constant improvement of design courses, allowing schools to incorporate a more open and up-to-date approach towards architecture education.

NOTES

[1] Interview with Ádám Somlai-Fischer, accessed May 30, 2021, https://epiteszforum.hu/miert-kene-reformalni-ha-a-fizika-torvenyei-nem-valtoznak--beszelgetes-az-epiteszkepzesrol-problemakrol-sikerekrol - for English version, see the Author's website

[2] Plutarch, Moralia

[3] Fuzzy Group Exhibition Event, 2021. Budapest, Igor Metropol and Off Biennale - https://www.facebook.com/events/443063826924259/?acontext=%7B%22event_action_history%22%3A[%7B%22mechanism%22%3A%22search_results%22%2C%22surface%22%3A%22search%22%7D]%7D

[4] Tranzit Budapest Art Gallery – accessed May 30, 2021, https://hu.tranzit.org/

[5] Dóra Hegyi, Zsuzsa László, Franciska Zólyom – Creativity Exercises: Emancipatory Pedagogies in Art and Beyond, tranzit.hu, GfZK, Sternberg Press, 2020. – The launching event of the book can be Accessed at https://vimeo.com/466581121?fbclid=IwAR0ESED5l9cUUUaenvY8j9IiJKtPvzQll4GPdZ9YxgZv2mN7PyZ6ZOd2u4Y

[6] Source accessed May 30, 2021, http://tranzit.org/exhibitionarchive/tag/istvan-nadler/

[7] GYIK Workshop, Budapest, accessed 30 May, 2021, http://www.gyikmuhely.hu/galeria

[8] Ludwig Museum, Budapest, https://www.ludwigmuseum.hu/en

[9] MÜPA – Palace of Art, Cultural Centre in Budapest https://www.mupa.hu/en/about/mupa-budapest

[10] The consultants of the subject were Anna Rácz, Zita Zöllner and Imre Ferenc Szűcs with the Author during the first semester of 2020/21. Academic year

[11] The website of PAF accessed 30 May, 2021, http://www.pafart.com/

[12] The consultants of the 2021 Sutdio were Rita Terbe, Zita Zöllner, Dóra Kalász, Imre Ferenc Szűcs and the Author

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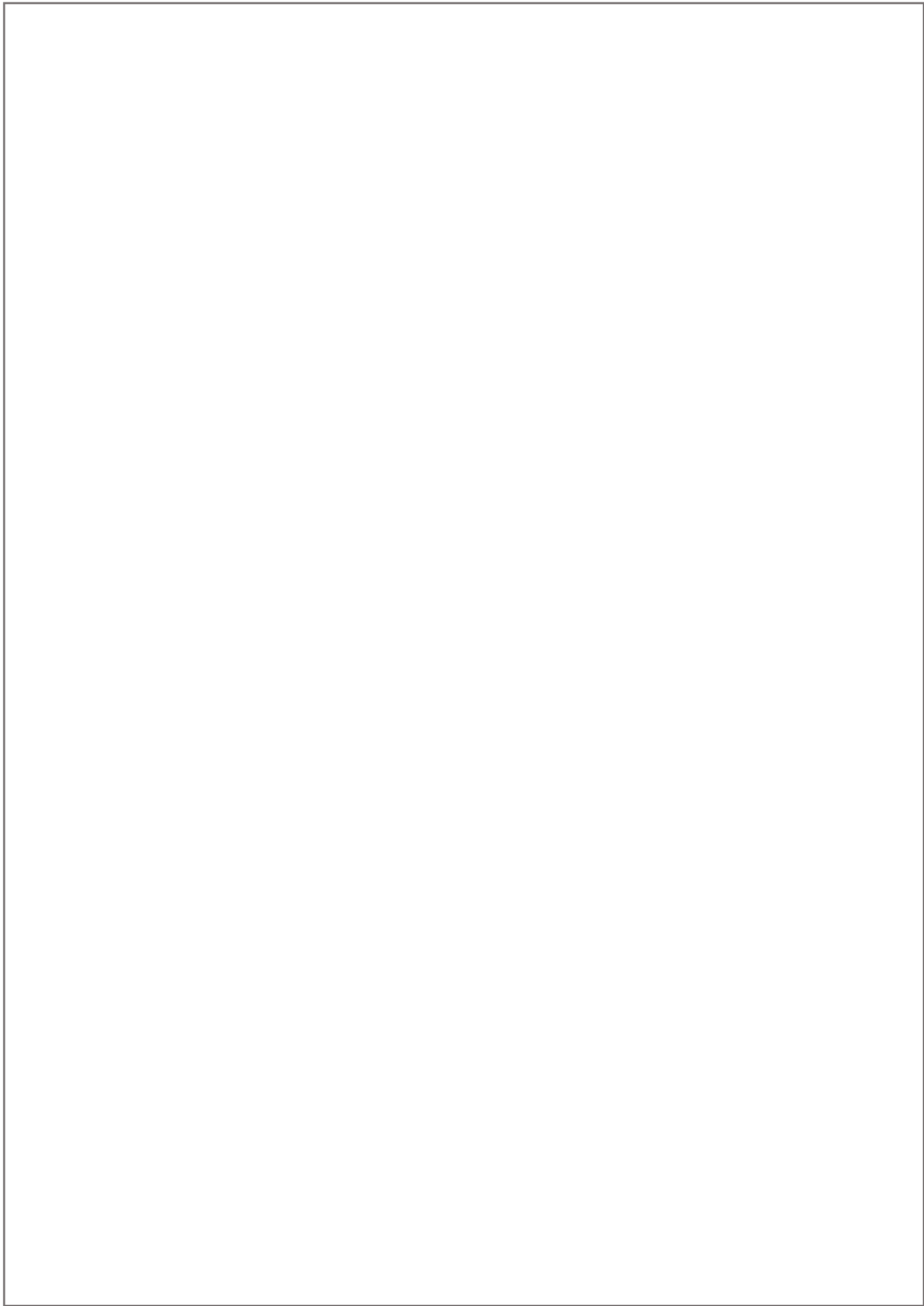Cecil, Wes: *Education: History and Development.* – university lecture online, 2021.05.09. accessed 30 May, 2021- https://www.youtube.com/watch?v=qPvKWnFe1tw

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