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Research article

Onsite/online: a case study approach pivots to virtual and back with new strategies learned

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Abstract

The course 'Concepts in modern architecture' is a hybrid between a lecture on the history of modern architecture and an interactive studio. Unlike traditional history courses that discuss many buildings per class, this one delves into a small, highly curated list of projects per session, allowing the students to develop a deep understanding of the architectural concepts used. As such, students form a critical eye to analyse buildings, and work on creative assignments that enforce and communicate these intentions. The course uses the author's IDEA (interaction, define/draw/diagram, engage and assess) methodology as a case study approach. From this 'learn by doing' perspective, students emerge with knowledge that speaks to historical references while utilising their creativity and design skills to assess the works studied. The shift to remote learning due to the COVID-19 pandemic forced this course to shift and evolve, as faculty educators in all disciplines had to rethink their teaching methods. Thus, the online and synchronous version of this course was reimagined in a different environment, using a combination of technological

and pedagogical tools that resulted in a strong learning experience with new objectives that engaged the students. Following the adaptation of this course into the virtual sphere, and then back again to the physical classroom, the article reflects on and considers the lessons learned from the experience. There is now a strong virtual course that in the future can continue to reach a broader audience, while the in-person version, which meets regularly back in the studios, has incorporated new techniques that will continue long after the pandemic is over.

Keywords modern architecture; defining concepts; diagramming ideas; interactive learning; new methodology

Introduction

For a course that studies architecture, the shift to remote learning due to the COVID-19 pandemic eliminated critical onsite lectures that allowed students to experience buildings first hand, as well as the ability to feel materials, move through spaces and connect with other users. Onsite sketching and studio-based diagramming were done in solitude. Once lively, in-person discussions and critiques occurred through the lens of a camera. This seismic change prompted new pedagogy, methods and techniques; the adaptation of in-person to online education radically – and quickly – pushed for inventive teaching and learning possibilities, and challenged a course to expand in unique ways. Now that in-person courses have resumed, new pedagogical strategies that evolved during the pandemic are being implemented in the classroom to create a stronger student learning experience.

The course 'Concepts in modern architecture' at The George Washington University (GW) in Washington, D.C., is a hybrid between a lecture on the history of modern architecture and an interactive studio. Unlike traditional history courses that discuss many buildings per class, this course delves into a small, highly curated list of projects per session, allowing the students to develop a deep understanding of the architectural concepts used. As such, students form a critical eye to analyse buildings, and work on creative assignments that enforce and communicate these intentions. They emerge with knowledge that speaks to historical references, while utilising their creativity and design skills to assess the works studied. The course uses the author's IDEA (interaction, define/draw/diagram, engage and assess) methodology as a case study approach. This article explores how this 'learn by doing' point of view was used during the pandemic to create a dynamic and engaging virtual course that introduces students to the history of modern architecture, while using studio-based work to reiterate concepts. The course was forced to shift and evolve, as the pandemic caused faculty educators in all disciplines to rethink their teaching. Thus, the online and synchronous version of this course was reimagined in a different environment, using a combination of technological and pedagogical tools that resulted in a strong learning experience with new objectives that engaged the students. Following the adaptation of this course into the virtual sphere, and then back again to the physical classroom, the author reflects on and considers the lessons learned from the experience. There is now a strong virtual course that can continue to reach a broader audience in the future, while the in-person version, which meets regularly back in the studios, has incorporated new techniques that will continue long after the pandemic is over.

I: interaction

The course is organised into a 15-week semester with 8 core topics from Topic 1: Bauhaus beginnings to Topic 8: Modern women architects. Each topic is allotted approximately four class sessions, typically two for content and two for review. The sessions are not referred to as 'lectures' or 'discussions' as they do not fit standard academic categories; instead, each class emphasises interaction and active learning, creating a more varied academic environment. In a virtual setting, the course is taught synchronously and students are expected to keep their cameras on.

Research shows that students' attention span during a lecture is roughly 15 minutes; attention and loss of retention of material then drops significantly: 70 per cent of students remember the information

given in the first ten minutes, while only 20 per cent of students recall content from the last ten minutes.[1] These statistics are for in-person learning; it is unknown what the data are for students attending class with no faculty educators or peers physically present, and many more distractions. Students had a new sense of autonomy within the new online learning platform; without discipline, many faded into the background or logged off completely. To maintain a steady flow of participation, students were called upon throughout the course and the class participation portion of the overall grade was increased. While there were challenges with student engagement, conversely, online learning created strong, independent learners, specifically when the content was presented in an engaging manner that provoked curiosity.

Active learning, while always important, is crucial for online learning. Harvard University's Derek Bok Center for Teaching and Learning states that 'active learning includes any type of instructional activity that engages students in learning, beyond listening, reading, and memorizing'.[2] And, while the term 'active learning' is not new to academia, the idea behind it must be amplified for remote learning. Within any online platform, there are a number of resources to provide for different means of learning. This course, taught using Blackboard, included visual presentations, video clips, breakout rooms of various sizes for class discussion, and utilising the Whiteboard, survey tool and chatroom. One of the stronger online tools, for both academic staff and students, was the ability to annotate directly onto the visuals, using the mouse or keypad, with thin/thick markers to draw/highlight, as well as shapes and colours to graphically communicate ideas directly on the slides. Ultimately, the goal for each session was to use a variety of active learning methods to keep the students attentive and engaged well beyond the 15-minute mark.

The main difference between this course and a traditional history course is that the visual presentation slides are used to spark conversation and raise questions, rather than teach historical facts. For example, in Topic 2: Less is more, image-based slides are presented to the students, who are encouraged to interject and/or are called upon to analyse architectural drawings before historical or explanatory content is given. This gives the students the opportunity to view the drawings with a critical eye and share what they see. The students connect the content to their own experiences, such as describing a space that provides a sense of enclosure, for example, the curved wood wall in Mies van der Rohe's Tugendhat House, or recalling a space they visited that emphasises movement, as compared to the fluid circulation in his Barcelona Pavilion. The student-as-user connection is continued within each topic; for example, in Topic 3: Machine for living, students examine Le Corbusier's Chapel Notre-Dame du Haut at Ronchamp, and discuss places of worship/spiritual spaces they have visited and the emotions those places conjure. In Topic 4: Organic architecture, students share the buildings with which they have a strong indoor/outdoor connection and compare the ideas of Frank Lloyd Wright, who blurred the lines of interior/exterior through materiality.

Along with required texts, a course pack offers timely, relevant articles that encourage conversation, with topics such as ownership of significant buildings and controversial additions. What resulted was a spirited debate in the main room, later balanced with smaller, expanded conversations in breakout rooms. The breakout room tool divides the students into a desired number of groups, either selected by the faculty educator or randomly assigned; it allows for more intimate discussions and the faculty educator can drop into these rooms or allow the students to converse on their own. When the faculty educator ends the breakout discussion, all students are filtered back into the main room. The breakout rooms were also used for topic review, as each room focused on a building discussed in the content portion of the course. For Topic 6: California modernism, this includes an analysis of Schindler-Chace House in room #1, Lovell Health House in room #2 and so on. When students returned to the main room, they utilised the Whiteboard to diagram the main concepts of each building, with each student in the group leading part of the discussion, both verbally and visually. Another lively option used to break up the course was the survey, which allowed for immediate feedback on related topics that led to a discussion. As such, the class utilised varied pedagogical methods in combination with online tools to keep the students focused and engaged.

New strategies

After teaching many virtual semesters of the course, it became evident that teaching online required raising the creative bar to keep the students engaged, especially since opportunities for distraction were amplified. Upon further reflection, it was clear that even in the physical classroom these new pedagogies could be integrated. While in-person courses are more straightforward – there are no

obvious communication barriers between students and faculty educators – a face-to-face class can still become stagnant and a pedagogical shake-up can breathe new life into its curriculum. As such, new strategies from the virtual platform are now applied to the in-person course: more video clips have been added to the content slides, students use polling devices/clickers for in-class surveys and breakout rooms are more intentional so that students meet with a varied number of their peers each time.

One of the strongest tools used in the online course was the Blackboard Whiteboard feature to diagram directly on architectural drawings while discussing different works. In the GW classroom, a projector utilised a pull-down screen in front of pin-up space and a laser pointer was used to highlight certain aspects of the works (unfortunately, there are no Smartboards in the studios). Now, a large, freestanding markerboard is rolled in front of the projector, so that the drawings are projected onto the board and faculty educators and students use markers to draw over the images to communicate ideas about the works studied. What appears to be a simple, non-technical solution is actually a strong learning tool that conveys intentions and allows students to fully engage in the topics of the course.

Another difference observed online was that student participation was a slower process overall, as they had to turn on and off their microphones and all of these small transitions took time. Reflecting on course participation during the virtual course, students appeared to be more considered when speaking in class as there was a stronger focus on them as participants, which was visually expressed as their video box was highlighted. This attention put a spotlight on their comments and more weight on their responses. Online discussions also featured a more balanced response from all of the students in the course, as opposed to a small number dominating the conversation. Now, back in the classroom, with a fluid back-and-forth and more spontaneity, it is evident that some students are less comfortable speaking out in class and that there is less time to construct a thoughtful response. In an attempt to bring a greater level of thoughtfulness to course dialogue, students are encouraged to take visual notes to use as a starting point to create thoughts and there is an intended pause prior to the conversation. Quick thinkers raise their hands first and participate more rapidly which can be intimidating for the other students. Allowing an in-class pause for students to think about a discussion prompt enables learners who require more time to be a larger part of the discourse. Overall, students have fewer distractions in the physical classroom; however, a greater variety of learning tools provoke interest and speak to the varied skill sets of different students. Not all students learn in the same way or feel comfortable participating; providing a mixed means of content delivery creates a more balanced discussion that is more inclusive of diverse learners.

D: define/draw/diagram

Rationale

The define/draw/diagram methodology emphasises the pedagogical idea that the history of modern architecture is best learned by doing, not memorising. Since active learning does not emphasise remembering as a key cognitive process, this course does not follow the prescriptive history of architecture course model of retaining facts for a mid-term or final exam. Instead, students are required to analyse buildings using a visual approach from each of the core topics – by defining the concept, drawing the building and diagramming the ideas. Learning facts is one process; learning to do something is another: in other words, what versus how.[3] Merging these processes allows students to apply what they are learning in a visual way, which connects more to the discipline. This pedagogical approach focuses on discovery- or enquiry-based learning and provides 'a focus on ideas and concepts . . . a strong activity-participation component where students are motivated to "learn by doing" . . . and the idea that content and process are inseparable components of learning'.[4] Within the content of this course, this idea is highlighted by design duo Charles and Ray Eames: their 'learn by doing' philosophy focused on process rather than result and led to some of the greatest designs of the twentieth century.[5]

Bloom's taxonomy pyramid diagram clearly expresses this concept, in that higher-order thinking skills such as creating, evaluating and analysing are proven to be more effective for meaningful learning (see Figure 1). This philosophy, published in 1956, was developed by Benjamin Bloom, an American educational psychologist at the University of Chicago. His taxonomy is 'a hierarchical model that categorizes learning objectives into varying levels of complexity, from basic knowledge and comprehension to advanced evaluation and creation'.[6] A later revision, published in 2001, titled

A Taxonomy for Learning, Teaching, and Assessing: A revision of Bloom's taxonomy of educational objectives, expands on the original premise. In the course 'Concepts in modern architecture', the key category/cognitive processes are evaluate, analyse and create – the three processes located at the top of the pyramid. As stated in the revision, 'remembering involves retrieving relevant knowledge from long term memory'.[7] This is more in line with a traditional history course that presents content with the expectation for students to be tested later in the semester with questions that retrieve facts about the buildings they learned about. 'When the primary goal of instruction is to promote retention, the focus is on objectives that emphasize Remember. When the goal of instruction is to promote transfer, however, the focus shifts to the other five cognitive processes, *Understand* through *Create*.'[8] This connects with the goals of this course, as students transfer what they have learned to a new application. When a student does not understand the material and/or cannot use it in a new condition, it is called rote learning, as opposed to meaningful learning, which allows students to solve problems.[9]

Figure 1. Bloom's taxonomy (Source: Vanderbilt University Center for Teaching)
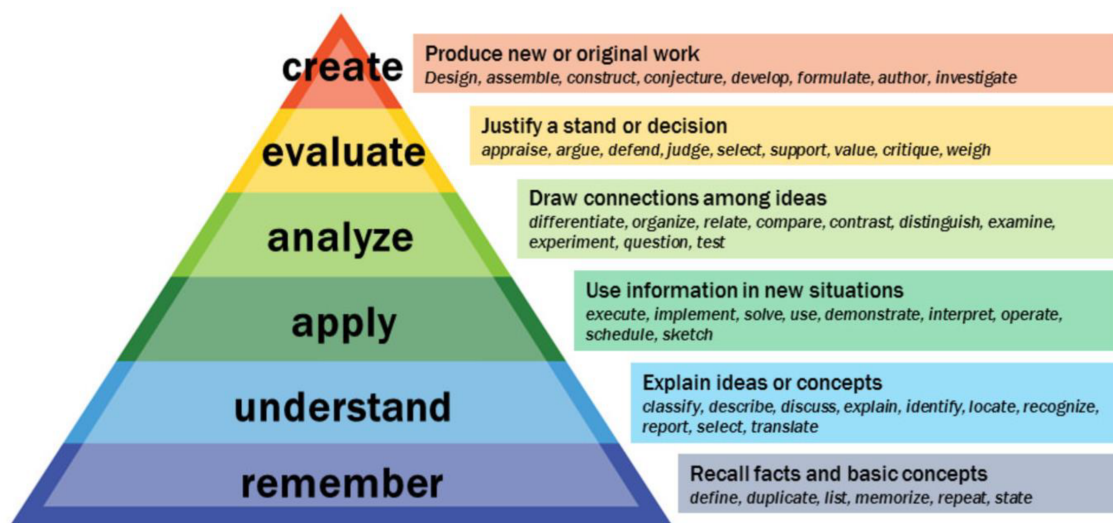
Progressing towards the apex of the pyramid past the more static processes – remember, understand and apply – students analyse and then evaluate the important concepts and ideas in the curated works. 'Objectives classified as *Analyze* include learning to determine the relevant or important pieces of a message (differentiating), the ways in which the pieces of a message are organized (organizing), and the underlying purpose of the message (attributing).'[10] Evaluate is 'defined as making judgements based on criteria and standards'.[11] With the emphasis on evaluate and analysis, the students finally reach the summit, create. '*Create* involves putting elements together to form a coherent or functional whole.'[12]

Ultimately, what results for students on this course is a creative project that requires an in-depth exploration of the buildings studied in class from course content, discussion, readings and further research; analysis of architectural concepts and ideas; evaluation about what should be represented; and the creation of diagrams to summarise and communicate these ideas. Most importantly, as stated above, students learn through the cognitive processes that emphasise doing. Prior to the pandemic, students made onsite visits to modern buildings in Washington, D.C., near the university and were able to analyse a number of the buildings that they had experienced. With the online course, they had to rely solely on obtaining drawings and photos of the buildings, mostly through online content, although they were also encouraged to utilise the university library system. This added another layer of research as students searched websites to find accurate architectural drawings among a multitude of misinformation, specifically on Google images. A building may have multiple iterations of floor plans with conflicting information, requiring further research. For more iconic/familiar buildings, videos are available online, which can be used in conjunction with plans/sections/elevations to better understand the buildings. Overall, this exercise emphasised the challenge and importance of finding and using authentic architectural drawings, as well as how to cite sources correctly.

Define

After students have researched a building through drawings, photos and video, they have the information they need to define a concept. Beginning designers often struggle with this idea, since there are many ways to approach and define a concept – or parti, as it is often referred to in architecture and design schools. The French word *parti* comes from *parti pris*, meaning decision taken.[13] 'The parti is the basic scheme or concept for an architectural design, represented by a diagram.'[14] In an introductory course such as 'Concepts in modern architecture', it is important to provide a methodical, consistent framework that can be followed throughout the course. As such, the author defines a concept by using a verb + noun combination to create a spatial idea, such as expanding volumes, overlapping circles or interlocking forms.

This approach focuses on an action (verb) that is seen in the architectural form (noun), which emphasises the dynamic qualities of a building. For example, if one looks at Rudolph Schindler's Lovell Beach House in Newport Beach, California, built in 1926, it is apparent that Schindler manipulates a typical house with identical stacked floors by shifting the second floor so that the living area becomes a double height space, while creating an indoor/outdoor transitional space at the entry. This brings together the action verb – to shift – with an architectural noun – plane – to create the concept 'shifting planes' (see Figure 2). Defining the core idea of the modern work studied is the starting point in understanding the project; after that, secondary ideas are discussed when diagramming the work on the Whiteboards. Ultimately, it is up to the students whether they utilise the same approach in the future or move on to a different method for defining concepts. For this introductory course, a uniform approach to conceptual definition creates a shared understanding within the course.

Figure 2. Shifting planes, Lovell Beach House (Source: Author, 2022)
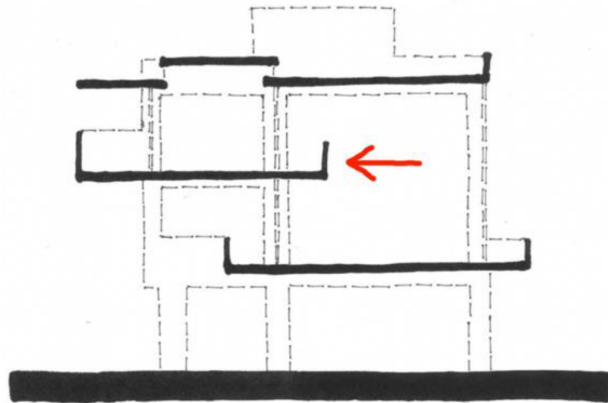
Draw

After defining the concept, students start the draw part of the methodology. Again, students shifted to using selected photographs from their research during the online version of the course. This step is done by freehand; straight edges and/or tracing is prohibited. And, while drawing from a photograph is not equivalent to actually being there, it allows the students to look closely at the building in order to draw it. Students are also warned not to draw from sketches found online, since sketches of a building are an interpretation and may have graphic elements that are not part of the building.

For the drawing portion of the method, students use exercises from *Sketching for Architecture and Interior Design*,[15] to provide a framework for understanding architectural ideas such as negative space, materiality, perspective, views and light, which allow for a more studied approach.

In the text *Drawing for Interior Design*, the author states that 'the handmade drawing may have been superseded by the computer-generated image as the principle presentation tool but it retains its role as a first means of delineating and communicating ideas.'[16] The define/draw/diagram method expands on this thought and adds the role of drawing as a means to understand ideas. It should be said that if a student has a difficult time defining the concept from the start, it can be helpful to shift the draw

aspect of the methodology first, since building exploration through drawing can also assist with concept definition. Another tool that is useful in this process is model-making by hand; much like a freehand sketch, the process of making a model strengthens analysis and allows the students to view the building in a unique way (see Figure 3). A study model, essentially a three-dimensional sketch, is particularly useful in the study of scale and proportion, and, since it is not a final model, most architectural details are eliminated.

Figure 3. Study models, various buildings (Source: GW students)

What drawing emphasises is process, not perfection or finality. The core objective is that drawing is a tool for seeing that provides for in-depth analysis of the conceptual ideas in a building or interior. Professor, illustrator and author D. B. Dowd states that 'we have misfiled the significance of drawing because we see it as a professional skill instead of a personal capacity. This essential confusion has stunted our understanding of drawing and kept it from being seen as a tool for learning above all else.'[17] Lecturing about a building does not encourage the students to see the building; the sketching exercises utilised in this method reveal to them how the defined concepts are executed as they start to see the verb + noun combination in three dimensions. These ideas are summed up succinctly by renowned British architect, Peter Cook, who states, 'a drawing should be an investigative device, a voyage of discovery, a series of glances in to the future.'[18]

Diagram

The next step is to diagram the ideas in the buildings examined. Again, this step connects with the top of Bloom's taxonomy pyramid. Applied to this course, this means taking what is learned through content, readings and course discussion; making decisions about what concepts/ideas are important; and using graphic communication to express these ideas in a visual, creative way. In the article 'Architectural design students', the author states:

> It is proposed that a structured approach using conceptual diagrams could provide a productive alternative to teaching methods in which students are encouraged to sketch constantly, with the hope of discovering unexpected emergent properties in these sketches. Sketches are shown to be useful in the creative process; however, an exclusive reliance on sketching for idea generation may put novice students at a disadvantage because they do not know what they are looking for in the sketches.[19]

While the drawing step of the methodology is about exploration, the diagramming portion is therefore about interpretation. This takes the information gained through sketching and visually translates and communicates what is learned.

As a diagram can take on varied meanings, the author relies on the clarity of a description provided by Francis D. K. Ching who states, 'the hallmark of a diagram is its ability to simplify a complex notion into essential elements and relationships by a process of elimination and reduction.'[20] As with drawing, diagramming is process oriented, meaning it is the act of creating and implementing the drawing that is significant, not the end result. 'A diagram is made of symbols and is about concepts. It is abstract and propositional: its elements and spatial relations can be expressed as a set of statements. It explores, explains, demonstrates or clarifies relationships among parts of a whole or it illustrates how something works (a sequence of events, movement, or a process).'[21] For example, the concept (verb + noun) of a building could be connecting segments, while other relevant ideas such as movement, massing and hierarchy are also identified as critical to the work. Diagrams representing each are created using varied line types, line weights, grey scales and/or colours to visually communicate these three-dimensional ideas into abstract, yet communicative drawings. The diagrams are created by freehand using pencil, pen and/or markers to further emphasise the process; the ideations evoke a human quality. Watercolour, collaging and other creative techniques are also encouraged. As students apply their findings – their research from drawing – to the diagrams, they are able to solidify the concept and intentions in the work. This reiterates what is learned and pushes the students to explain their results in a creative, visual way (see Figures 4–6).

Figure 4. Define/draw/diagram, nesting circles, Hirshhorn Museum and Sculpture Garden (Source: GW student Melany McGillvray)
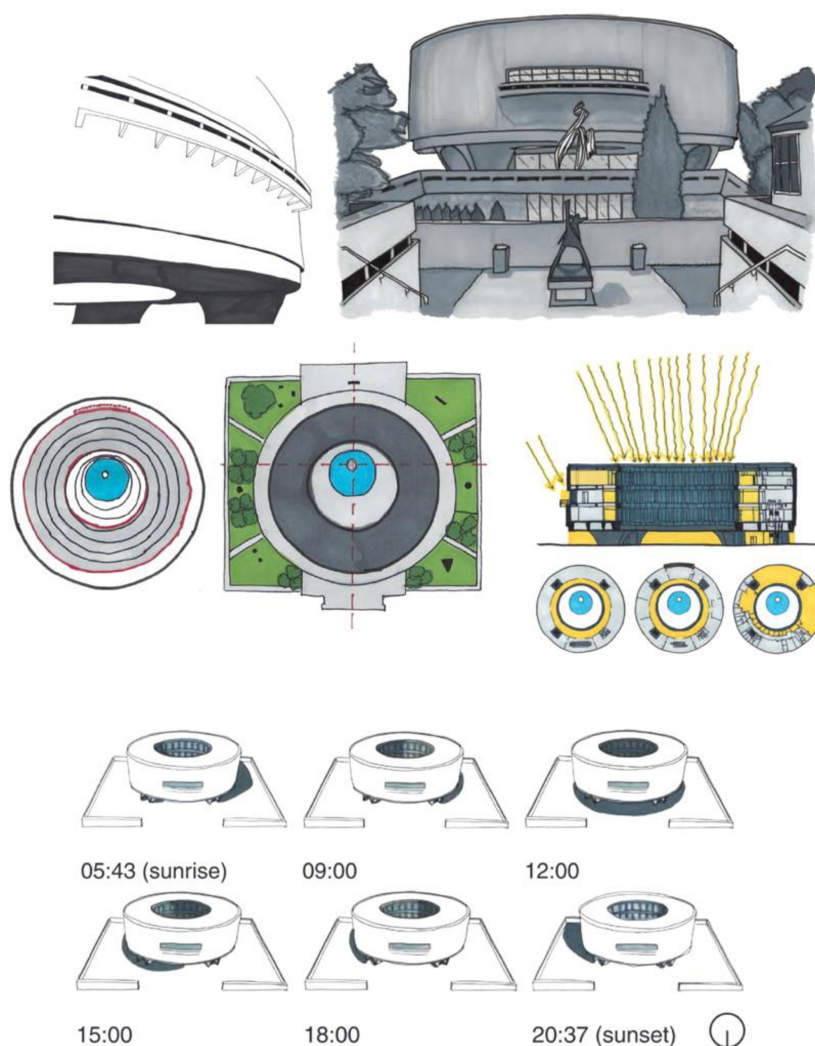
Figure 5. Define/draw/diagram, curving form, Dulles International Airport (Source: GW student Melany McGillvray)
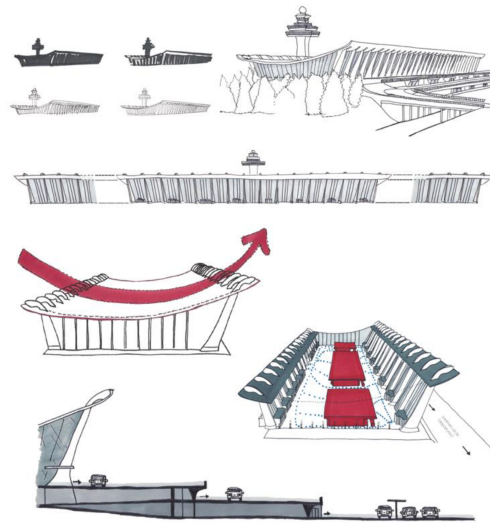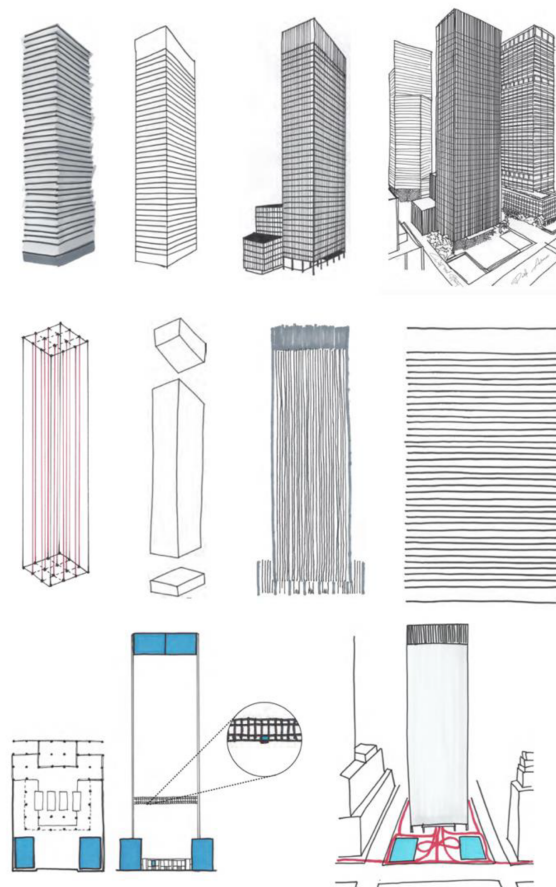

Figure 6. Define/draw/diagram, extruding grid, Seagram Building (Source: GW student Melany McGillvray)

New strategies

The define/draw/diagram methodology in the virtual course was successful, although students lacked the opportunity to apply this method to buildings visited in real life. The in-person classroom also allows for a studio culture and a more fluid exchange of ideas, as students can view their peers' work throughout the process, which often increases the quality of the work. Designers do not create in a vacuum and the analysis process is more meaningful when ideas are exchanged. That being said, one advantage of the online course was that the students were responsible for researching and finding drawings of the buildings studied. While the in-person course provided the drawings, the online course required students to seek out plans, elevations and sections. As such, students mastered a new aspect of architectural research and the use of citations in reference to drawings, and in the process, they were exposed to many new architectural websites, blogs, periodicals and books. Now, back in the classroom, students continue to research and find their own drawings – which has become an important part of the project – even as onsite visits resume.

E: engage

After the content for a topic has been covered through active learning and the define/draw/diagram method for the topic is complete, the students engage in sharing their analysis with their peers. Engagement is an integral element of the curriculum and the studio in design education is considered the core of the curriculum. In *The Architectural Studio*, the author states, 'the studio is the central tool through which the entire professional and theoretical curriculum is taught in the framework of courses. In the studio, the student's works are criticized and subjected to constant discussion . . . this produces a unique learning experience that is intellectual and emotional.'[22] The critique is a strong learning tool for design students as they 'are required to confront basic concepts and knowledge and to give them a conceptual verbal and visual interpretation'.[23] Rethinking supporting courses – typically thought of as lectures, special topics or curricular requirements – as studios would provide more continuity within the curriculum and emphasise engagement, seen in studios but often lacking in these other courses. Within this studio-based analysis of modern works through the define/draw/diagram methodology, students share, critique and discuss concepts and ideas, just as in the studio, where 'seeds are planted through the same questions that will confront these future architects during their career, after graduation'.[24]

For the online course, instead of submitting to the professor or sharing their work in a brief pin-up format, the students were required to submit through an online sharing platform. This allowed all students to view each other's work and provide peer reviews using a rubric. In the article, 'Rethinking feedback practices in higher education', the authors state that the skills within the peer-review process 'include the ability to engage with and take ownership of evaluation criteria, to make informed judgements about the quality of the work of others, to formulate and articulate these judgements in written form and, fundamentally, the ability to evaluate and improve one's own work based on these processes'.[25] Thus, there is a shift from who the critique is for (the professor) to who is learning the material (the student). Now, the students submit their projects to the entire class through a sharing platform – even the word 'sharing' creates a more inclusive community – which takes the emphasis away from the academic staff-to-student relationship, while encouraging a student-to-student synergy.

New strategies

The major change of the engage aspect of the virtual course was the pivot to a sharing platform for submitting and reviewing work; prior to the online course, students submitted their work directly to the professor. This virtual course addition is now incorporated into the in-person classroom. Upon reflection, it is evident that a timed critique of work pinned on the wall does not give a student enough time to absorb their peers' work. The shared platform allows students more flexibility and time to do this at their own pace. This puts the onus on the students to review the work, which aids in creating self-regulated learners. Barry Zimmerman, a leading researcher of student learning and Distinguished Professor of Educational Psychology at City University of New York, states that 'self-regulation is important because a major function of education is the development of life-long learning skills'.[26] Giving the students access to their peers' work and allowing them ample time to review the projects aligns with inclusive learning,

as not all students can absorb or grasp the ideas in a condensed presentation. This part of the project is now an important task in the trajectory of the project, and students are aware from the start that each of them will be responsible for reviewing all of the work submitted. In this format, students also have the ability to reach out directly to their peers for follow up or additional information.

A: assess

Throughout the assessment process, students learn that their opinion is worthwhile, which gives them more confidence in providing strong feedback. They utilise a rubric to evaluate their peers' work, by first gaining an understanding of what a rubric is, and then how it can assist in the assessment process. As defined by the Carnegie Mellon University Eberly Center for Teaching Excellence and Educational Innovation, 'a rubric is a scoring tool that explicitly describes the instructor's performance expectations for an assignment or piece of work. A rubric identifies criteria (the aspects of performance), descriptors (the characteristics associated with each dimension), and performance levels (a rating scale that identifies students' level of mastery within each criterion).'[27] For the assessment to be successful, assessments, learning objectives and instructional strategies need to be connected. Often, the faculty educator provides a rubric and uses it to assess the students in the course. In 'Concepts in modern architecture', students review the course and learning outcomes, and create their own rubrics for peer- and self-critique; this involves the students in the process instead of providing them with a standard form. They then use the rubric as a tool which is beneficial for introductory peer critique, especially among new students who do not have a large architectural vocabulary.

In the online version of the course, the peer reviews were collected and shared in breakout sessions. Back in the main room, students presented part of their work and also 'switched' diagrams to present their peers' work. This exercise builds architectural vocabulary, communication skills and provides practice in 'reading' diagrams. Prior to the conclusion of a course topic, students did a 'quick write' during a class session, summarising the main concepts/ideas of the topic (macro) and the case study (micro). Students were then selected to share their topic summaries. They not only assessed their work, but also that of their peers through these exercises, as a building analysis elicits a different response from each student. Through this assessment, the core principles of modern architecture were explored in an original way that gave the students the tools to think critically. In creating an open learning environment, the idea of transparency is critical. 'Transparency is an essential attribute of quality assessment instruments and refers to the clarity of assessment expectation for students and the clarity of procedures for making judgements about a student's work.'[28] Using a rubric with a set group of standards gives each student a framework for critiquing their peers as well as a base line for evaluation.

New strategies

The assess part of the course was easier to transition to online. Having ample time to review the students' work in the sharing platform, rather than being required to give impromptu feedback during a peers' pin-up, allowed for a more thoughtful response. Unsurprisingly, a more studied critique from the students created one that was stronger. The use of rubrics also allowed for a more methodological approach to critique. Much as a rubric assists the faculty educators with assessing and grading students' projects – especially helpful with more subjective work – the rubric gave the students a consistent and fair framework against which to measure their peers. The specificity of the learning outcomes and the rating from one to four required the student reviewers to think carefully and provide meaningful feedback to other students. This process also gave them insight into how they are often assessed and graded, something they will take with them as they work on future projects.

Conclusion

Despite the move online, 'Concepts in modern architecture' remained a highly interactive course, as each topic was explored through a number of active learning exercises that utilised varied online tools. The core concepts of a course, whether onsite or online are: *Interaction* – where active learning is emphasised through a variety of learning tools to create a dynamic experience and accommodate diverse learners; *design/draw/diagram* – where students explore the eight topic case studies by *doing*

instead of memorising, that is, creating work based on the author's methodology of identifying the verb + noun concept; drawing as a tool for seeing and diagramming as a means to communicate ideas; and *engage + assess*, where students share their analysis with their peers and take ownership with a self-created rubric as the method of evaluation. Ultimately, this method for analysing projects reiterates course content in a creative way and emphasises and strengthens skills to be used in the students' own projects. While in-person interaction and building-site visits are strong tools for learning about modern architecture, the *IDEA* method created an online experience that met the learning objectives for the course, kept students engaged with course content and encouraged conceptual thinking and in-depth exploration of ideas. From onsite to online and back again, 'Concepts in modern architecture' is now a stronger, more dynamic teaching *and* learning experience: Charles and Ray Eames would approve.

Notes

[1]   Prince, 'Does active learning work?', 226.
[2]   Harvard University, The Derek Bok Center for Teaching and Learning.
[3]   Michael, 'Where's the evidence that active learning works?', 161.
[4]   Michael, 'Where's the evidence that active learning works?', 163.
[5]   Eames, *Eames: Beautiful Details*, 108.
[6]   Armstrong, 'Bloom's taxonomy'.
[7]   Anderson and Krathwohl, *A Taxonomy for Learning, Teaching, and Assessing*, 66.
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Consent for publication statement

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