Inclusive Disegno.
From Individual to Collective Competency

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Abstract

Horses gallop, birds fly, architects draw. Learning design through drawing has been, and continues to be, the most fundamental method of studying architecture. With drawing literacy in decline since the late 1990s, both supporters and skeptics have declared the "Death of Drawing", pitting digital against hand drawing. Given this situation, what are the functions of architectural drawing today, particularly those that can enable learning? This article discusses a pedagogical method that aims to cultivate a student's desire and competency to collaborate through an inclusive drawing process. This approach draws inspiration from a long history of precedents, from handscroll paintings of the Qing-dynasty to Modern experiments of "exquisite corpse," the drawing game of "Dot-the-Dot" by the Texas Rangers, and the contemporary drawing practices of David Gersten, Carol Arches, and Momoyo Kaijima.

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Can tacit learning survive at the school of architecture?

Tacit knowledge in suspension

In the mid-1990s, Bernard Tschumi advocated and partly implemented what was then a forward-looking pedagogy of the "Paperless Studio" at the scale of a school, in his case the Graduate School of Architecture, Planning and Preservation at Columbia University. It was an experiment wherein the process of design was encapsulated within the computer and displayed through the screen. Paper and its intimate sibling the pencil took leaves of absence during Tschumi's reign. The half-decade experiment eventually led to the crowning of GSAPP as one of the three "pioneering centers" of digital architecture by *Architecture* magazine (Cramer, 2000: 90). The editors portrayed its design studio as "weird classrooms" for its lack of paper drawings. As radical of an idea as that was, architecture schools around the world are currently confronting a much more consequential experiment of the "Studioless Studio," resulting from the remote-learning conditions imposed in response to the Covid pandemic, where physical has been supplanted by virtual.

The period from early 2020 until the current time of 2022, offers architectural educators glimpses of what education *could* become. Prolonged as it seems, we are just at the cusp of a transformative juncture. Everything we thought would happen in the future is being fast-forwarded, ranging from optimistic-expedient-smooth to pessimistic-inhibitive-disruptive. From the way instructions are prepared, delivered, and evaluated, to the way teachers and learners communicate, recent experiences have redefined conventional meanings. The pandemic has brought to the fore questions and experiments that have been brewing in the background. The harsh lights of our current living/working/studying conditions are pointing up and magnifying questions regarding how we teach, where we teach it, and to whom we teach it. These circumstances force us to address a critical question: *Can tacit learning survive at the school of architecture?*

If nothing else, what the past couple of years has positively demonstrated is that teaching and its ancillary activities such as preparation and coordination can be enhanced through virtual platforms. Student presentations now are more focused and organized. However, the negative impacts of current conditions are alarming. The online transmission of knowledge

has desensitized the "embodied learning" experience traditionally associated with the studio pedagogy. The tactile and haptic essence of studio instruction has become aloof and blasé through the ubiquitous communicator of the LED monitor. These degradations have reinforced the need for the studio "as we knew it," including fostering an atmosphere for making, intellectual exchange, peer empathy, mutual support, and knowledge production. Cognitive scientists have made the distinction between three types of knowledge: *Declared*, knowing what; *Procedural*, knowing how; and *Tacit*, knowing implicitly or intuitively through experience (Stillings, 1995: 369). The last is familiar to architecture students because it is so engrained with the studio's immersive learning experience, and a fundamental skill enabling enduring competency. Tacit knowledge is the type of knowledge being disrupted the most by the pandemic.

Drawing and collaborative competency
Arguments have been made for drawing's capacity to stimulate synthetic feedback between haptic and cognitive perception, as well as our ability to understand the world. These include scholarly efforts in the disciplines of fine arts (Alpers, 1983), social sciences (Arnheim, 1974), and architecture (Frascari, 2012). Architect Alvaro Siza has asserted that the ability to "learn how to learn" is profoundly linked to the notion of "learning to see, to understand and to express through drawing" (Siza, 2008: 3). Philosopher and sociologist Bruno Latour has not only coupled drawing with thinking as an embodied experience but has given credence to its ability to enhance comprehension and trigger imagination (Latour, 2012: 25). Drawing is so ingrained with the act of design that the word *disegno* in Italian means both to design and to draw. French expresses the same intrinsic relationship by offering two words that are cognates of the Italian and obviously closely related to each other: *dessin* (drawing) and *dessein* (design, loosely translated). These words, as well as, obviously, the English *design*, are descended from the Latin – although variously attributed to *designare* or *designo* or even to *signum* – but bring their meanings to us more expressively by way of the etymological conjunction of *de-*, outwards, + *sign*, to cut, mark, indicate, signal, allot, name, and assign.

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To draw, therefore, means to enable the intellectual and bodily capability to invent design. Building on these discourses, I would argue that among all tools, drawing is one of the most effective ways to attain tacit knowledge in design. Furthermore, the impact of drawing or learning to draw can be experienced not only by individuals but by groups of people learning and working together.

There are two common approaches to drawing pedagogy. The first type considers digital technology as the new pencil (Mitchell, 1989), while the other demands the primacy of drawing by hand (Levin, 2002). As early as 1989, supporters of the "digital pencil" called into question the usefulness of drawing as a discipline in architectural education. Francis Lyn and Ron Dulaney Jr., who analyzed data collected from a survey of ACSA member schools, assert that most design curricula described hand drawing and digital media as being "more or less equally important to their pedagogies," yet resources dedicated to digital media far outweigh those for hand drawing: while over "50% of the surveyed respondents indicated that their programs offered three or more courses dedicated to digital media, only 35% indicated a similar number of courses dedicated to hand media" (Lyn, Dulaney, 2009: 23). However, despite all the excitement about digital media, it is still impossible to argue that the integration of digital tools in the production of architecture has had an automatically positive effect on our built environment (Pérez-Gómez, 2005: 217).

The death of drawing (Scheer, 2014) and decline in the availability of drawing courses is not limited to architecture but also to the fine arts. Well-regarded artists have been fighting and advocating for the reinvigoration of drawing. At the Royal College of Arts, students are offered drawing "feedback" rather than compulsory classes (Alberge, 2021). Whether digital or manual, drawing has traditionally been taught through required courses under the purview of visual communication. The goal tended to be the acquisition of skills to enhance the singular mastery and deftness of students. Drawing instruction mostly has focused on cultivating students' "individual talent and creativity" and not, for instance, their capacity to work with others (Bialkiewicz, 2019: 117).

Consideration of these goals and effects of drawing instruction triggered my curiosity about the nature of collective competency. If drawing can foster a productive symbiosis between the mind and the body within an individual, what happens when many individuals draw together? What will happen when the action of drawing is expanded to involve two, five, ten, or even twenty collaborators? What, if any, visual, cognitive, or social interaction and mutual advancement will this togetherness inspire? In exploring the synergetic and mutable potential that the act of drawing encourages, an inclusive system would explore and expand upon benefits that go beyond the individual, and toward the collective.

Fig. 1 - The drawing projects are organized through a structured and rigorous progression of research to synthesis, simple to complex, and quickness to slowness, it nurtures a collaborative-friendly drawing approach involving shared contributions, ranging from small groups of two to large collective of twenty.

Over the past few years, I have developed an inclusive drawing system that nurtures symbiosis between participants. By observing interactions between the students who participated in the drawing workshops, I came to understand benefits of "relational collaboration" and how it may be utilized in design education. I also learned that not all collaborations are equally effective. Transactional collaboration that works in a linear progression as most clearly exemplified by the Fordist division of labor–and which is ultimately necessary in the production of architecture–contributes little to creative synthesis. Relational collaboration, on the other hand, is derived through an exchange of tacit knowledge (Hagel III et. al., 2009). It offers cre-

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ative autonomy to the individual while learning from and sharing with others. In its most effective implementation, relational collaboration offers a scalable benefit that is contingent upon others' creative input. I found that for relational collaboration to succeed, it must be incubated in a carefully designed learning environment and framework that provide rules of engagement, a non-judgmental atmosphere, appropriate time limits for phases of work including periods of reflection, and sufficient working space both for the participants involved (Hwang, 2021).

Drawing away from single authorship
Inclusive drawing is the act of diminishing single author mentality by inviting or allowing others to participate. It is also part of a lineage of co-creation praxis. During the twelfth century, Chinese artists used handscrolls to depict urban or natural landscapes, typically between 20 to 25 centimeters in width and up to 12 meters in length. One well-known later example is the horizontal scroll *Along the River During the Qingming Festival* (1736) a Qing dynasty painting, created by five painters Chen Mei, Sun Hu, Jin Kun, Dai Hong and Cheng Zhidao, all belonging to Emperor Qianlong's painting academy. Collective drawing also has a deep history in other cultures. For instance, cave drawings from the Paleolithic period are the evidence of a primordial collaborative creation process. Or consider the drawing (and literary) exercise of "exquisite corpse," conceived in the early twentieth century by Surrealists including André Breton, who declared in the *Second Manifesto of Surrealism* (1930) that "the collaborative efforts intend to result in the creation of a unique drawing." Also, there was the improvised drawing game of "Dot-the-Dot" devised in the 1950s by the Texas Rangers, a group of young architectural faculty -Bernhard Hoesli, Colin Rowe, John Hejduk, Robert Slutzky, Lee Hodgden, and Werner Seligmann, among others- who created an unprecedented teaching program at the University of Texas in Austin. The drawing game placed emphasis on inventive fluency in hand drawing combined with an innate knowledge of historic European city plans (Morris, 2013: 20). In more recent times, Yoshiharu Tsukamoto and Momoyo Kaijima of Atelier Bow-Wow have challenged their students at TU Delft and Harvard's GSD to observe their urban surroundings and to record their discoveries through a series of "Public Drawings". That firm's urban detective approach, defined in *Made in Tokyo* and *Graphic Anatomy,* has inspired our own research. Other collective

drawing advocates include the architectural, artistic, and pedagogical practices of Niall McLaughlin, Carol Arches, and David Gersten. Communal contribution draws away the singular authorship typically associated with drawing by exploring and amalgamating multiple perspectives. It encourages shared conversation, imagination, responsibility, and cooperation. Through their introduction to the act of inclusive drawing as a method of inquiry, students are given the time and space to gain insight and reflection, enabling them to discuss the subject of inquiry through the common ground of the shared drawing surface and drawing tools.

Fundamental steps to begin the inclusive drawing process are a teacher-prepared set of questions for the group followed by all-participant discussions on the rules of engagement. Included should be a deliberated set of procedures and methods that enable all participants to engage in the process. Students can be given the opportunity to decide and develop conditions such as the theme of the drawing, the drawing instruments to be used, and the duration of time dedicated to the production and to stages of production. There should be consideration of where or on what will the drawing be drawn: might it be on the stone floor of a public space? On a single large piece of paper? Or perhaps on multiple pieces? Will some other material such as canvas be used? Although the seeds of the questions are planted and fertilized by me, the teacher, they are nurtured with enthusiasm by the students, who will reap the harvest of their efforts (or not). Topics such as these are discussed not only for practical and logistical purposes but as a means of engagement and to build mutual understanding and respect. This conversation between the participants empowers them to take ownership of not only the drawing production but also the parameters of the collaborative experience.

Kowloon Streets, Past-present-future (2019) and *Sectioning Adaptive Reuse* (2020) were two projects we developed in which we explored inclusive drawing in a dense, complex, urban context. Although drawings that result from any particular exercise may differ from other exercises, the two drawings that we will discuss below, resulting from the fore-mentioned classes, are long horizontal scrolls co-created in both cases by ten students. As per the agreed-upon rules, scrolls were divided into equal areas for each student, with joint responsibility for an area at the center. Each student is required to coordinate with their neighbors on effecting bridging between their respective drawing portions.

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Fig. 2 - Detail of "Kowloon Streets, Past-Present-Future" depicting a multi-temporal and spatial moment where different streets and historic events converged, drawings by Hiu-Yan Lau, Tsz-Wing Wu, Susan Siu-Shan Law, Carol Hiu-Kan Ning and Jesse Lok-Hei Wong.

Kowloon streets, drawing from fiction
The first scroll I would like to share is called *Kowloon Streets, Past-present-future*. The drawing serves as the first episode of a visual research study for a semester-long M.Arch studio which called for the design of a Hong Kong Archive in the year of 2037 (an imaginary future). This was a study of, and an attempt to draw inspiration from, the city's urban context and history. Instead of urban morphological mapping, diagrams to graphically summarizing socio-economic conditions, or other common methods of site studies associated with design teaching, the urban detective drawing process allowed students a more immediate and personal lens for contextual reading. The aim was to uncover compelling stories behind the streets of Kowloon.
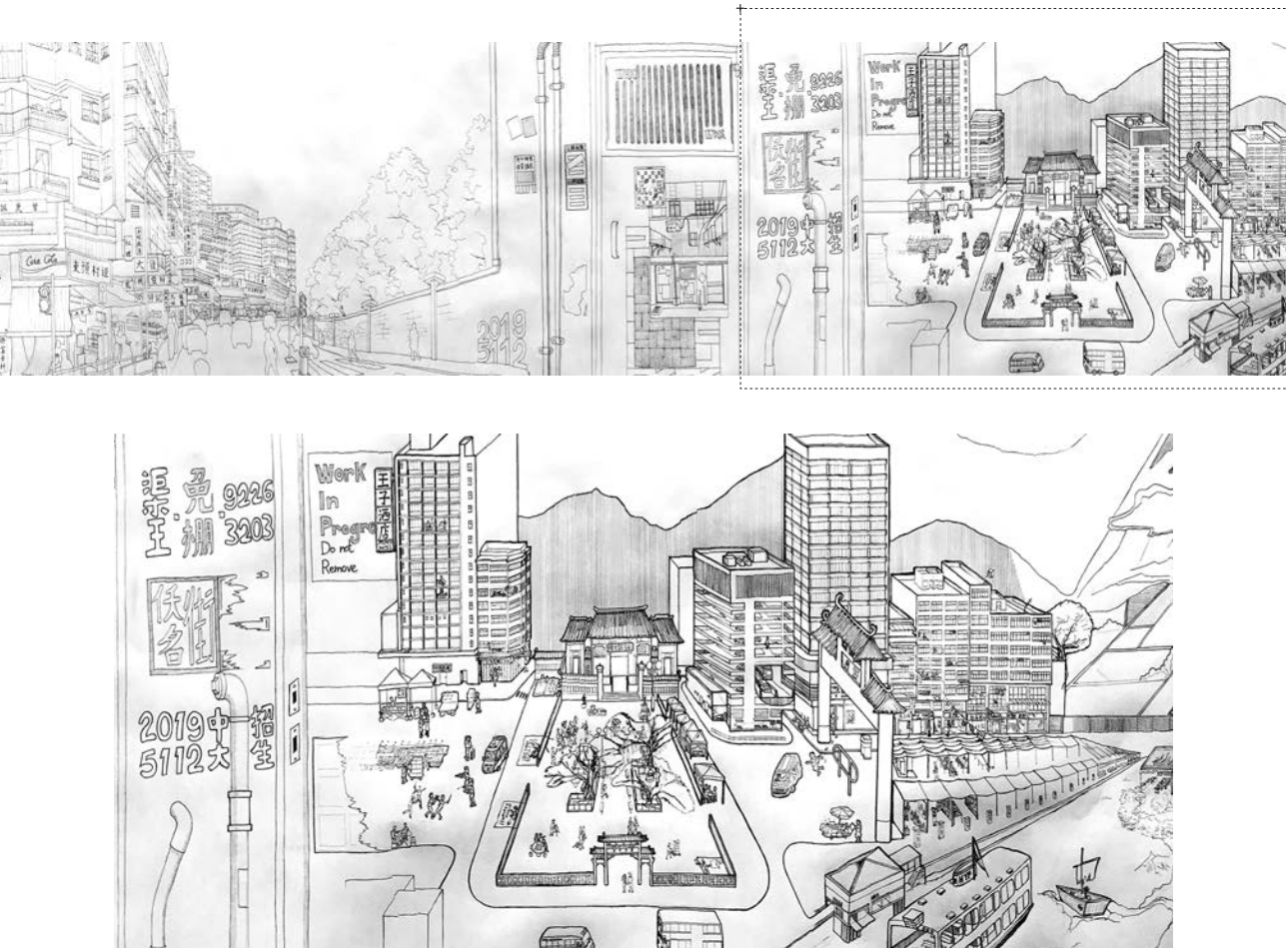
Research involved both primary and secondary sources. The former was a graphic ethnographic survey of the streets that the students were exploring. The latter was Dung Kai Cheung's *Atlas, An Archeology of an Imaginary City* (1997) a quasi-fictional work set in an imagined future version of Hong Kong. The book is a mixture of fact and fiction, narrative, and description. Its twelve chapters delve into the details of the city's streets, attempting to account for their histories, literary legacies, myths, and fantasies. With Dung's fiction and their own individual research and reflections in mind, each student selected a street from the book to depict on its own terms and to blend or interlace with the streets explored by classmates. The composite, inclusive drawing folds, blends, propagates, and extrapolates history, theory, and fiction.
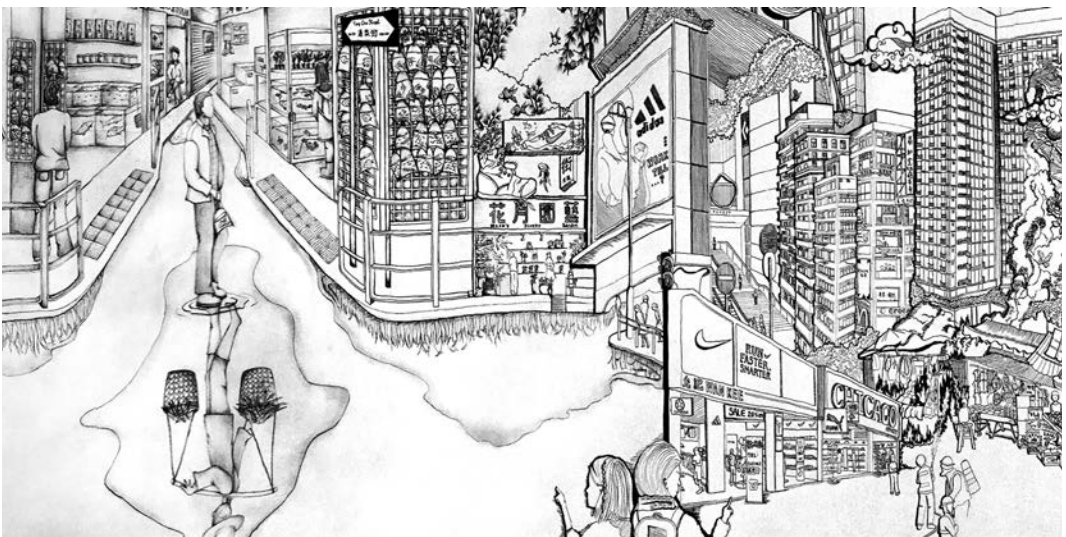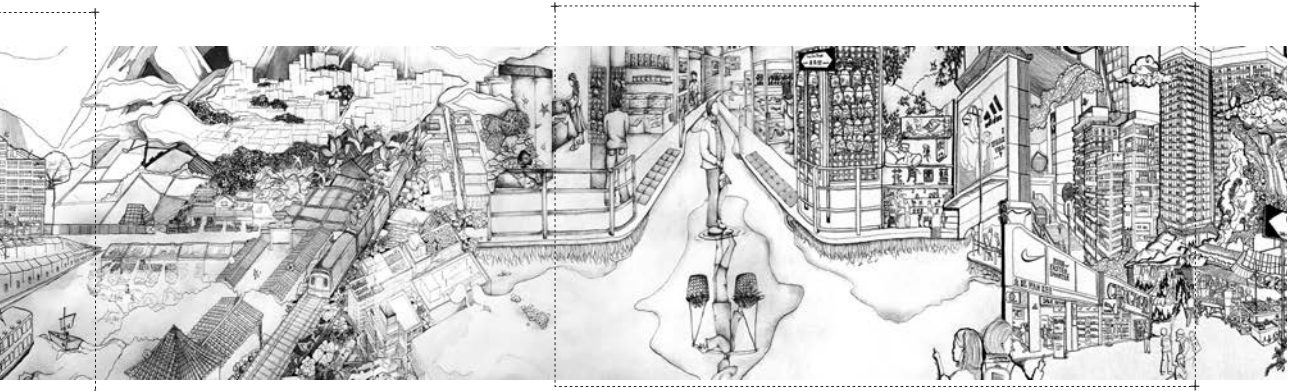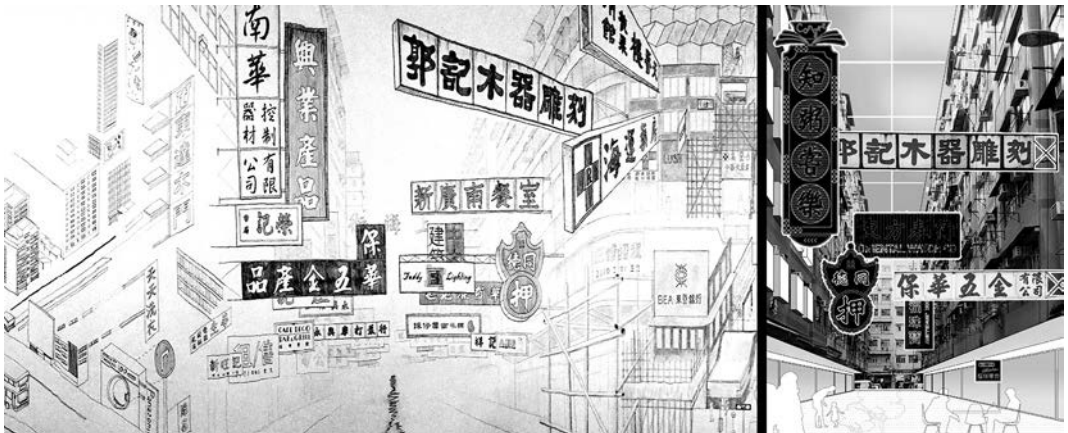
Fig. 3 - Initial drawing on the left focusing on disappearing street signage of Hong Kong leads to the design development of a term-long architectural project of an archive building on the right by Victor Ka-Lok Wong.

Our initial detailed discussions and careful planning provided critical structure for the improvisation that was needed in the production of the drawing.

Our initial detailed discussions and careful planning provided critical structure for the improvisation that was needed in the production of the drawing. The students decided to bring their own drawing styles into the scroll but agreed to limit media to graphite and ink. Students also agreed that their individual drawings could variously depict elevations, sections, and perspectives, rather than adhere to a single type of view. The divergent viewpoints resulted in dynamic transmutations between the streets and their views across the scroll's ten-meter length. An example is shown in the transfiguration of Boundary Street and Tung Choi Street, revealing a dialogue and convergence between two spaces and times drawn by three different students. The drawing depicts the transformation of the district around the territorial boundary between the British *Kowloon* and Chinese *New Territory*. Before 1860, farmers from the north came to the boundary to sell flowers to the British at the south. Later when the border dissolved, Boundary Street was named in memoriam. The scene then moves to Tung Choi Street on the right, where again there is an image that both merges and contrasts present and past: the central upright figure and vertically oriented street image (a depiction of the modern-day "Goldfish Street") simultaneously divide and join, crisscrossing space and time within a constant but constantly evolving geographic context; the impact of the drawing's intent is magnified by the fictional but historically informed (and clever) image reflected in the puddle. The rhythmic pulsation from one street to another was made possible through an imaginative symbio-

sis between the students. For this convergence to be visualized and rendered, historical, sociological, and environmental research – and the sharing of knowledge through these investigations – had been fundamental. The students collaboratively and successfully created a fictional yet truthful graphic interpretation of Kowloon, filtered through the lens of Dung's Atlas. *Kowloon Streets* explored manifestations of the city's reality, searching for and imagining identities. By having multiple participants join in juxtaposing, overlapping, augmenting, and transfiguring the different Kowloon streets, the drawing scroll became a "Multitopia" echoing Dung Kai Cheung's words: "cases of sudden transgressions of one space into another... an open place, welcoming choice and inviting the unexpected." The act of drawing invites the invisible to be made visible. In this sense drawing helped the students to identify key archival contents of their term-long projects. Since drawing is selective, what they chose to draw affirmed those elements and issues that interested them. This clarification of intentionality helped the students to develop a narrative for their design projects. For example, in Victor Ka-Lok Wong's drawing, he identified the post-1930s tensioned-cable street signs as the repository content for his archive. Due to the change of regulations in 1996, no new signs were allowed to be put up in the city. Therefore, the street sign holds a significant value for the people of Hong Kong as it is closely associated with a nostalgic period and genre of the city. After the inclusive scroll drawing exercise, students further translated their designs, as indicated in more specific and detailed images.

Fig. 4 - Novelist Dung Kai-cheung discussed his creative writing process by crisscrossing fiction, theory and history using Hong Kong as a retrospective and prospective context. Premised around the notion of Architecture, City and Narration, discussion focused on the shared creative process bridging across cultural disciplines.

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Fig. 5 - Long scroll "Sectioning Adaptative Reuse" serves as a platform for collective competency. By uncovering canonical heritage buildings' sectional spaces, students were able to discover and recreate new and imaginative spaces formed by, and in between case studies. It is an example where analysis and synthesis formed a feedback relationship.

Collective competency was developed through the tacit exchange of pencil on paper with sharing of time and space.

At the end of the *Kowloon* drawing project, Dung Kai-Cheung was invited to the School of Architecture to discuss his creative writing process of reinterpreting the tale of the city through its streets, billboards, buildings, people, things, and history. We discussed how the city serves as the common ground between architecture and literature, and how both creative forms learn from the city and, in return, reshape the city by reimagining it. Generating a dialogue on the reciprocal relationship between history and fiction, or the notion of "Future Archaeology", a term Dung has used to describe his work. Collective competency was developed through the tacit exchange of pencil on paper with sharing of time and space.

Drawing Heritage through Section
Sectioning Adaptive Reuse (2020) was the second inclusive drawing project that offered an augmented way of seeing and interpreting architecture and the city, specifically through consideration of converted heritage buildings. It was a collective exploration of ten adaptive-reuse projects across their sections. The selected case studies were exemplary transformation buildings of modern heritage from different parts of the world. Before drawing, students researched original sketches of the building's design, the history and context, as well as methodologies of adaptive reuse; they also produced sectional drawings which demonstrated the archaeological layers of the building. It was an act of constructing a visual narration of the building's history. Multiple students were responsible for the assembly of parts of different case studies, which accentuated the collage-like nature of the architectural conservation process. Through the mode of architectural section, the resultant drawing was part documentation and part imaginative extrapolation of the case studies. This method of study enabled the students to analyze and perceive heritage potently by drawing the old and new architectural elements.
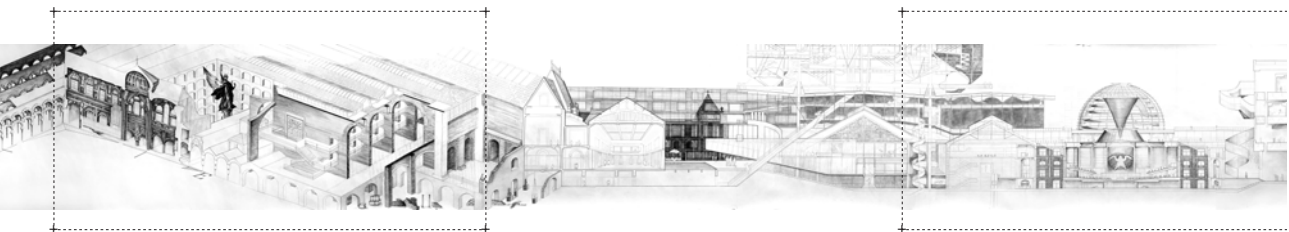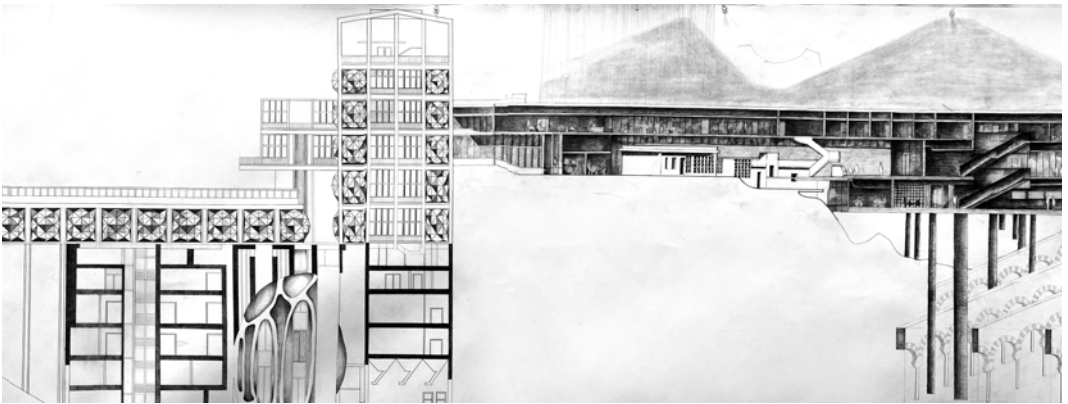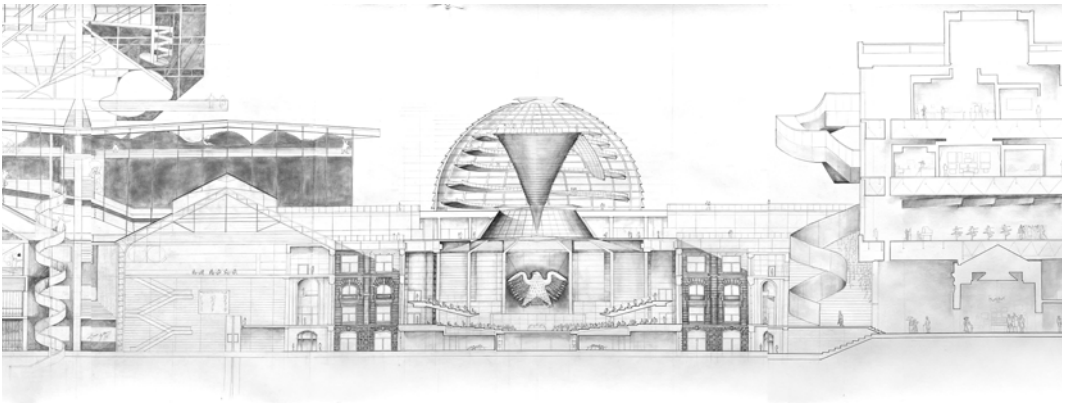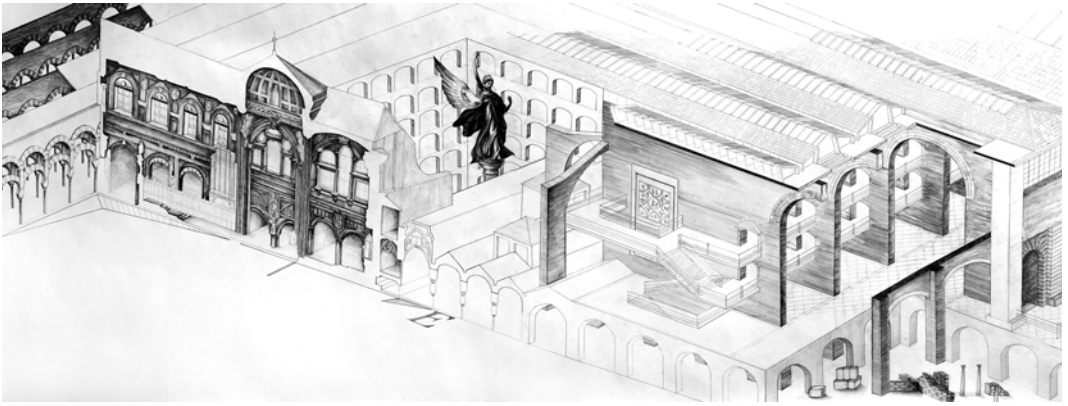
Fig. 6 - Detail of "Sectioning Adaptative Reuse" reconstructing Ibos & Vitart Architects' Musee des Beaux-Arts on the left morphing into Bernard Tschumi's Le Fresnoy Contemporary Art on the right. The ends of two existing buildings gave birth to a new architectural creation through the drawing of Annie Hui-Bing Zou and Marcus Ting-Kwang Ma.

The section as a representational mechanism has typically been associated with its capability to reveal the hidden works of an existing building – often as a retrospective or analytical technique.

Derived from both archaeological and anatomical practices, the section originated as a retrospective tool and an analytical device. In "Vertex and Vortex: A Tectonics of Section," Jennifer Bloomer describes the convergence of inscription and incision as the moment when a section is born. To inscribe is to capture a situation by giving it a visual presence; it is a trace, a memory, a description in between the viewer and the spatial narrative beyond. To incise is to discover the unknown of the beyond; it is a physical act, a temporal state of reading and understanding. Furthermore, the notions of gravity and orientation must be considered in the making of a section. Bloomer argues that "a plan is a section which demands the presence of gravity": it must be connected to the world of tension and compression.

In a collaborative drawing, the continuous sections inscribe a "map" in Bloomer's sense. They bring the eye into a journey across revealed space within the incised buildings, as maps "have something to do with representing places-geography; but they are as importantly about time-chronology, what we do, how we move through." The section as a representational mechanism has typically been associated with its capability to reveal the hidden works of an existing building – often as a retrospective or analytical technique. It is an alternative experience of reality. This phenomenon can be seen in the students' work as shown in Fig. 6. Observe how Ibos & Vitart's Musée des Beaux-Arts transforms into Bernard Tschumi's Le Fresnoy Contemporary Art, while Herzog & de Meuron's Caixa Forum mutates into META4's Hong Kong Blue House Cluster. The Musee's glass façade evolves and is superimposed on the steel roof canopy of Le Fresnoy, forming a cinematic montage. The sectional investigation of the buildings, therefore, becomes both documentation of the existing case studies as well as new architectural fabrications.

Drawing conclusions
Planets orbit, lamps glow, architects collaborate. Architecture, undeniably, has always been an interdisciplinary, collaborative, and team-based endeavor (MacKeith, 2013). At every stage of the architectural process, from conceptualization through construction, collaboration is essential and unavoidable. However,
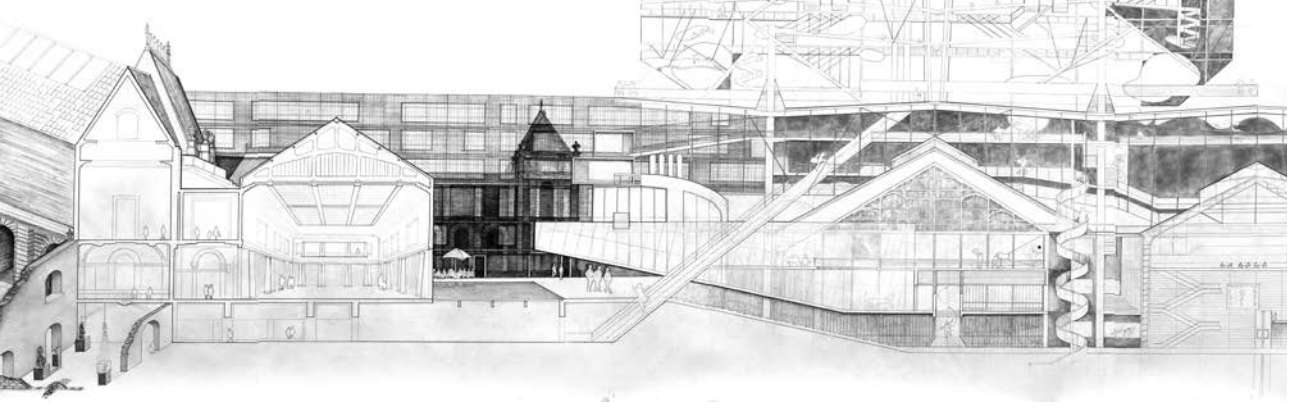
the education of the architect has remained fixated on the individual. Other than a few exceptions in the form of design-build studios, research groups, or team design, there are few pedagogic models capable of fostering relational collaboration.

Working collectively while maintaining the individual creative spirit, the drawing system narrated in this article offers a shift that challenges the ingrained notions of penmanship, originality, and ownership that dominate our conception of competency in architectural learning and practice. As a system of co-creation designed to accommodate multiple diverse visions, the final work is the outcome of a genuinely shared effort built upon the thoughts and actions of each participant. The process allows for improvisation in which no single participant can fully control the result. The inclusive drawing process stimulates students by expanding their imaginations and shaking them out of their comfort zones of working individually.

In the first drawing example, *Kowloon Streets,* there is the ambition to reveal different historical incidents that have shaped Hong Kong, drawing from what it was and what it is to what it could be, allowing invisible dialogues between different epochs to be made visible. The paper scroll is both independent in parts and unified in whole, forming a space-time of "Unitopia" as depicted in Dung's book. In the second example, *Sectioning Adaptive Reuse*, the work proposes an alternative framework that offers critical editing of architecture and conservation. In a broader context, the retrospective and prospective characters of the architectural conservation process can be experienced through drawing in the present. The pair of drawing projects provide a method not only of delineating the past but of prefiguring a future. They go beyond the mode of drawing representation and into the realm

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The inclusive drawing method enables creative autonomy while teaching skills of working collaboratively, as it demands a critical and methodological approach that transcends the limits of the individual.

of design co-synthesis. The "ground surface" of the paper, therefore, serves as a site of memory, documentation, and imagination.

As the classroom for nurturing tacit knowledge is in a weakened state, whether due to the general and seemingly prolonged demand for speedy representation via digital media or because of the recent and hopefully short-term impacts of the Covid pandemic, we return to this ever-more-important question: *Can tacit knowledge survive at the school of architecture?* The inclusive drawing method enables creative autonomy while teaching skills of working collaboratively, as it demands a critical and methodological approach that transcends the limits of the individual. By designing ways of drawing together, this approach aims to sow seeds of imagination and to promote positive attitudes toward relational collaboration in the young minds of would-be architects.

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