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Manual of best practices for a blended flexible training activity in architecture for higher education institutions.

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This volume returns the results of the Intellectual Output 03 of the research project "Archea. Architectural European Medium-sized City Arrangement", with the aim of analyzing and restating the state of the art achieved in the field of flexible mixed training in architecture, strongly encouraged by the emergency period of the Covid-19 pandemic. The result is a collection of good practices carried out internally and externally to the Archea partner network, in the context of higher education institutions, made possible by new virtual tools capable of mediating teaching and mixed and flexible learning around the disciplines related to the project.

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a cura di Enrico Prandi e Paolo Strina

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State of the Art: the experiences of ARCHEA Network

Felix Mayer
Experiences with digital teaching formats during the COVID-19 pandemic at the Department of Spatial Design at the Faculty of Architecture, RWTH Aachen University, as illustrated by the course Einführen in das Entwerfen (Introduction to Design)
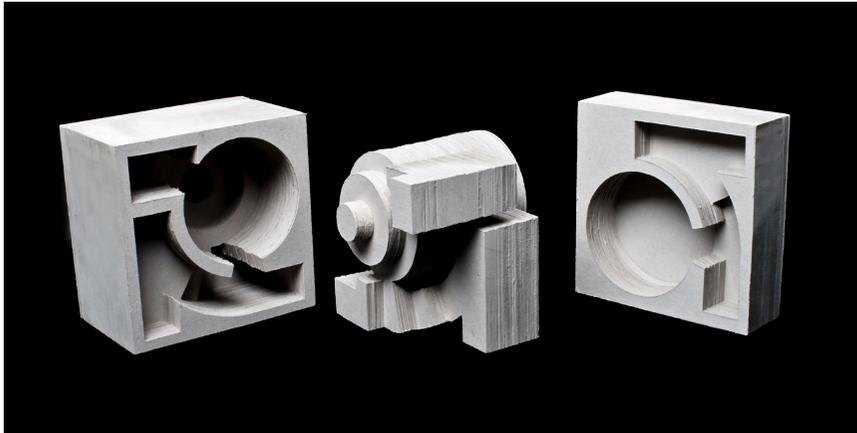
**Fig.01** Student design project by Weizhen Guo, 2011. Photo: Department of Spatial Design, RWTH Aachen University

Introduction

With the arrival of the COVID-19 pandemic in Central Europe in March 2020, all of the courses offered by the Department of Spatial Design at the Faculty of Architecture, RWTH Aachen University up to that point immediately had to be converted into digital formats. How was this supposed to work in a discipline that is particularly characterized by analog work (drawings and models) and intensive exchange? The following text is a retrospective experience report describing the possibilities and limitations of digital formats in architectural education, using the course Einführen in das Entwerfen (Introduction to Design) as an example. After a brief outline of the module, both the analog teaching concept and its conversion to a digital teaching format during the COVID-19 pandemic are described. This is followed by a personal evaluation by the author about lessons learned and developments for the future of the course.

I.   The Entwerfen (Design) Module

The Department of Spatial Design pays particular attention to space in its teaching and research: "Space must be simultaneously reestablished and enshrined in the essential determination of architecture as a superordinate category. Professor Uwe Schröder thus understands the teaching of architecture to be the teaching of space, which, by working through the 'history of space,' sets the focus of historical architectural observation firmly on space. A 'theory of space' would need to identify the peculiar spatiality of architecture in order for architectural design to ultimately become 'spatial design.'"[1]

The Entwerfen (Design) module is a practical introduction to design as a core discipline of architecture for first-year students. Two practical exercises (designs) in the first semester and a project in the second semester constitute a systematic approach—with increasing complexity—to essential aspects of architectural theory and praxis. The objective of the course is to enable students to recognize fundamental architectural patterns, elements, spaces and typologies, as well as to analyze their regularities and apply them in their own designs. They are to formulate ideas and concepts independently and develop simple space-creating approaches. Through a building, students should be able to establish a relationship to the city and conceive a building in its context.

II.   Analog Methodology (pre-pandemic)

The way project work was carried out in pre-pandemic times was through individual tutorials. Discussion took place at regular colloquia, as well as at the final public presentation in front of the group as a whole. This strengthened some key competencies in the students, such as presenting and peer criticism, as well as the ability to act, communicate, and interact independently. Analog drawings and models were used methodologically in the first year of study, especially in the first semester.

The students in each of the assigned groups worked primarily in their designated workrooms. The teachers were able to supervise the projects directly on site at each of the group tables. Working in the same room resulted in interesting discussions between teachers and students as well as among the students themselves. Collaborative learning with

and from each other was an elementary component of the teaching concept in this configuration.

In order to strengthen the students' understanding of design and space, the practical exercises involved making models from plaster, concrete, and chipboard, in addition to creating analog drawings. In addition to learning individual skills, this also helped them to independently review their respective designs.

Alongside the work in the workroom, the curriculum was supplemented by walks through the city and field trips. This form of knowledge transfer in very concrete (spatial) situations translated what was theoretically discussed in the classroom to the built environment and vice versa.

III. Digital Methodology (during the pandemic)

With the arrival of the COVID-19 pandemic in Central Europe, the analog teaching format described above also had to be converted to a digital format immediately. In order to be able to keep teaching activities running as smoothly as possible, we attempted to transfer the analog concept directly into a digital concept as quickly as possible. The overarching methodological and didactic questions were followed by very concrete challenges: Does each and every student have a computer? How can the students get to know each other and how do we comply with all aspects of examination and data protection regulations?

In all of these considerations, the fulfillment of the learning objectives described above (I.) were top priority, alongside protective health and safety measures. All course sessions—every supervision and colloquium—were therefore conducted via video conference. Students prepared their designs and drawings from home and digitized them using a smartphone or scanner. Screen sharing enabled the drawings to be discussed and revised. Model building had to be discontinued due to the closure of the workshops, so axonometric representations replaced the students' three-dimensional work. The students were also asked to arrange individual drawings on digital boards so as not to neglect rehearsing a complete presentation including the layout.

Participants in the course are first-year students, most of whom come to Aachen from other cities to study. In order to promote exchange among them, smaller preliminary exercises in group settings were also carried out in the digital format as often as possible. As part of this, the students would exchange ideas in breakout sessions before each sharing their findings with the group as a whole. Overall, all sessions were aimed to be as interactive as possible, despite the lockdown.

IV. Limitations of Digital Teaching Formats

After a year and a half of dealing with digital teaching formats as part of the course Einführen in das Entwerfen (Introduction to Design), it can be stated that it is practically possible to teach the fundamental aspects of design in a digital format. The learning objectives were still able to be achieved, even during the pandemic, and student outcomes were of a high standard. Although implementable, however, the opportunities provided by digital formats are significantly limited compared to analog teaching formats. There are five areas where this becomes particularly evident:

First, the limited methodological work when designing. One of the most important methods for teaching space and spatial design in this course is the model. This helps students gain a better understanding of space. Drawings, such as axonometric representations, can only replace this to a limited extent.

Second, the limited building of relationships. Digital collaboration creates a different form of contact. Teachers appear to students as much more abstract people who are distant or possibly unapproachable. They can only be reached via (video) telephone or email. The first-year students were lacking a place

Fig. 02 Excursion with students to the Saint Benedict Abbey, Vaals, 2015. Photo: Oliver Wenz, Department of Spatial Design, RWTH Aachen University.
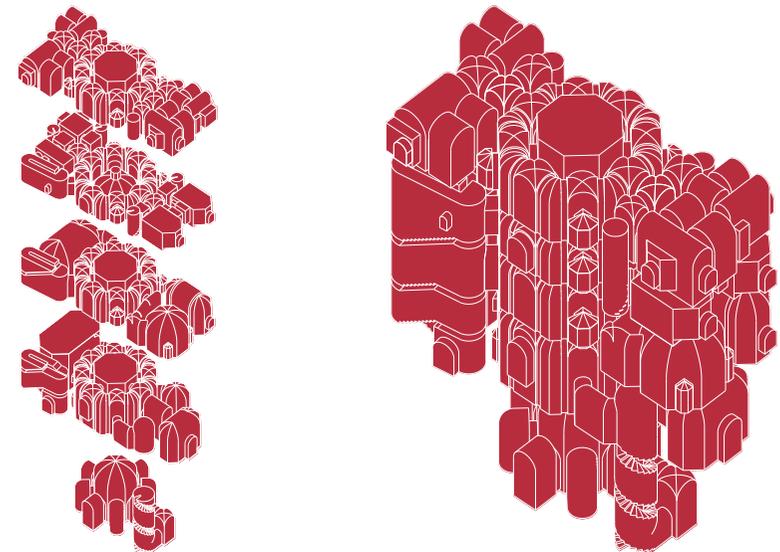
Fig. 02 Student design project by Ivo Mehring, 2020. Axonometric drawing of the inner space.

to interact with the teaching body, or more precisely, their physical presence, which would enable them to get to know them fully. In addition to this, the students were lacking a place of learning—their faculty. This weakened their identification with their own university.

Third, the limited opportunities for getting to know each other. As described above, working with each other in groups, as well as mutual exchange and support, is of elementary importance in the study of architecture. Getting to know each other properly usually takes place through intense collaborative work on a project, or individually after shared classes. Video formats cannot ensure this form of togetherness and community.

Fourth, the limited non-verbal communication. Despite the small videos of the other people in the video call, neither their overall body language nor their exact facial expression can be recognized. Have the students understood the content? Have they already been aware of the point for a long time? Did the lecture arouse their interest? These are all issues that are especially crucial for teachers in analog tutoring situations and which do not work well practically in digital formats. In addition to this, discussion sessions are much less spontaneous in digital formats. Due to the lack of simple gestures, permanent intense moderation is needed. Spontaneous exchange in small groups is limited due to the technology.

Fifth, the abandonment of field trips. In order to sharpen students' understanding of dimensions, proportion, materiality, space, and so on—in other words, architecture as a whole—regular field trips and walks through the city were offered in the analog teaching format. During the pandemic, no comparable solution could be found.

Conclusion

The restrictions on teaching during the COVID-19 pandemic catapulted architectural education into a digital age in a way many previously thought was unfeasible. Despite the aforementioned limitations, students were able to safely and remotely continue their studies within the standard period of study. The need to transform the entire course into a digital format in one fell swoop during the pandemic should therefore be seen as a major experiment. This needs to be evaluated and opportunities for the future identified.

So, what can we take away for the future of teaching, in what we hope will be a post-pandemic era? Technological tools such as video calling, digital learning spaces and virtual concept boards are becoming more sophisticated and intuitive all the time. We should try to incorporate these into our courses in the future, where possible. Sharing additional available material, planning events, and documenting results can all function excellently through these platforms. Larger events, lectures, and conferences should continue to be available as streams to allow interested audiences from other faculties to access them.

The experiences from the course Einführen in das Entwerfen (Introduction to Design) have shown that in emergency situations it is possible to run the course digitally, although the significant limitations, especially for first-year students, have become clear. Design, and the teaching of design in particular, thrives on an approach that makes use of analog drawings and building models, as well as intensive exchange with the students. The atmosphere of working in community with other students cannot be replaced virtually, nor can the atmosphere of an analog final presentation with all the drawings and models displayed exhibition-style. On the methodological level, areas were identified that cannot be replaced digitally, such as model building and field trips together. Above all, the importance of the interpersonal level is not to be underestimated. This applies to contact with students and particularly to contact between students.

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