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2021

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

This volume returns the results of the Intellectual Output 03 of the research project "ArchéA. 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 ArchéA 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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Manual of best practices for a blended flexible training activity in architecture for higher education institutions

edited by Enrico Prandi and Paolo Strina

Analisys of the Best Practices
Guest professors

Fig. 01 Moodle integrated annotation plugin, available on the grade function of the assignment module
Fig. 02 Microsoft Teams integrated with the Microsoft Whiteboard

Alessandro Camiz
**A Distributed Virtual Learning Environment (DVLE)
for a Constructively Aligned Architectural Design Studio**
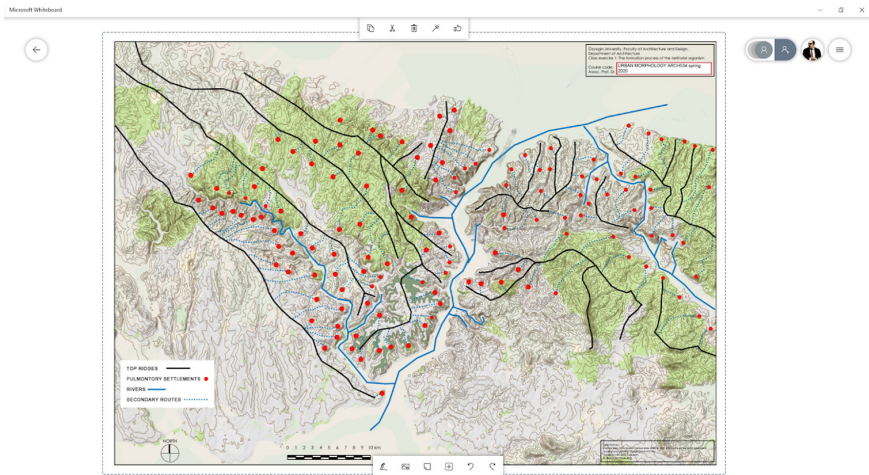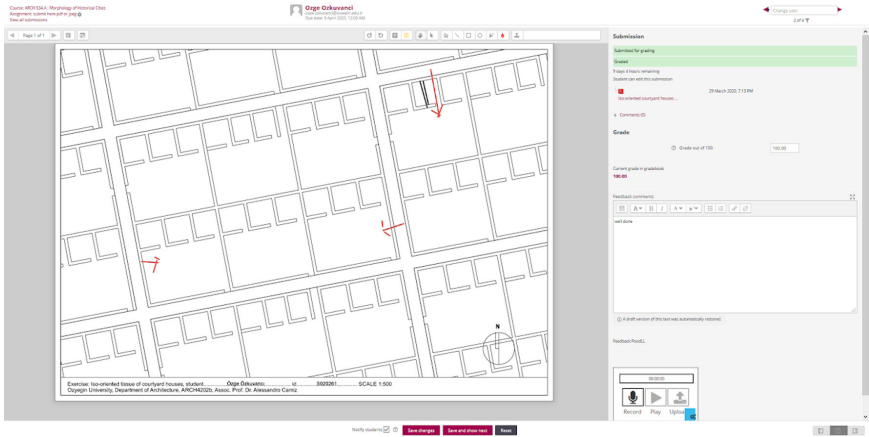
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Abstract
In the last 30 years there has been extensive research about online teaching, outlining the importance of the interaction modes and the constructive alignment of the intended learning outcomes (ILO) and the teaching and learning activities (TLA) (Shuell, 1986), (Houghton, 2004), (Laurillard, 2012), (Biggs and Tang, 2011). Nevertheless, the literature about online teaching for architectural design is quite scarce and seems to ignore the recent findings of pedagogy (Rongrong, Gu, Skates and Feast, 2021), (Quintelli. Maretto, Prandi and Gandolfi, 2020), (Bologna and Trisciuoglio 2020). In order to update our syllabi for online teaching during the pandemics we established a dedicated research unit, named "Online Architecture", at Özyeğin University, (Camiz, Verdiani, Özkuvancı and Alak, 2020). Therein we tested several online tools that could be used to constructively align the teaching and learning activities (TLA) and the intended learning outcomes (ILO) of our online architectural studios. After selecting the proper tools, we aligned them with the ILO and deployed them within a Distributed Virtual Learning Environment (DVLE). This paper illustrates the finding of such a research unit and describes the applications of the DVLE in the architectural design studios for the years 2020-2021.

Keywords
Architectural composition — conversational framework — constructive alignment

«For just as in a person with a trained memory, a memory of things themselves is immediately caused by the mere mention of their places»

Aristotle, Topica, 162, 24-30.

Constructively aligning the ILO and the TLA
Teaching should be considered as a recursive activity: you teach others, but by doing so you learn from them, you evaluate students, but by doing so you inevitably end up evaluating yourself. The action of planning, should therefore simulate beforehand this process and help each course to improve every semester, tending constantly towards perfection. In the last 30 years there has been extensive research on how to teach online, outlining the role of the different levels of interaction and the advantages of the constructive alignment of intended learning outcomes (ILO) and teaching and learning activities (TLA) (Shuell, 1986), (Houghton, 2004), (Laurillard, 2012), (Biggs and Tang, 2011). Within architectural design the alignment of outcomes, activities and assessment is somehow different from other fields. Maybe the closest one is that of writing, or musical composition. Since architectural composition is meant to produce drawings and models representing an architectural project, and is a synthetic intellectual activity, its pedagogical approach should differ from the one used in other disciplines. Considering the teaching of architectural design online, the literature is quite scarce, at least it was in March 2020 when the Faculty of Architecture and Design of Özyeğin University decided to move online all the designs studios. So we entered a relatively new field, open for discussion. All the courses I taught in the past

5 years have been following a blended model, using Moodle for most of the online parts, the homework submissions, the final submissions, to share literature and cartographic data with students, and finally to notify the grades to the students. Now, with the 100 % online model we were forced to follow, the novelty were the online lectures, which are not particularly different from live ones, and (talking about architecture) the online juries and reviews. In a word the collective synchronous online assessment of projects (drawings and models), with visual drawn feedback (review). Now doing this activity online was new, but it is a form of assessment, and indeed it is the core of the teaching in a design studio.

When Özyeğin University decided to move online all the courses in March 2020, we had just one week of time to update the syllabi and to set up the online teaching platform. At that time there was no extensive published work on how to teach an architectural design studio entirely online. Besides referring to the existing literature for the general pedagogy of online teaching, we established a dedicated research unit "Online Architecture" within the Dynamic Research on Urban Morphology-DRUM laboratory, in cooperation with the Dida Labs of University of Florence (Camiz, Verdiani, Özkuvancı and Alak, 2020). Therein we tested several online tools that could be used to constructively align the teaching and learning activities (TLA) and the intended learning outcomes (ILO) of our online architectural studios. After testing them we experimentally deployed them within the Distributed Virtual Learning Environment (DVLE). Our aim was to build an online system capable of a productive and healthy studio experience, remembering that an architectural studio, as the name suggests, should be more a professional studio than an academic classroom, or at least a classroom teaching the students how to be professional architects. From that first theoretical premise, we extensively selected digital tools and tested them within our classrooms and summer schools, always revising them upon the feedback that we could collect from the students, and after 4 semesters, our studio environment is now suitable of publication as the results ended up being better that those obtained with in presence studios in the past in the same university.

Different tools for online design reviews (formative assessment)
We opened a Microsoft One-note notebook dedicated to the research group and therein it was possible to discuss and share different options for the online reviews of architectural drawings. The systematic need of reviewing visual materials is indeed the main difference in online teaching between architectural design studio courses and the other disciplines. We tested a number of different digital tools of the formative assessment of drawings for an entirely online architectural studio (Tab.1).
The comparative table above illustrates only a few of the many tools we tested and compared. At the end of a testing phase, carried out with the help of some graduating students, we ended up selecting the Google Jamboard as the best option for the formative assessment. Within the reasons for the choice was that it is free, whereas we had to pay for some of the other good candidates, also Jamboard is included in Google Educational Suite, and Özyeğin University has a subscription to it. Finally, it did what we needed it to do: freehand annotation of drawings online. We should say that at that time, Google Jamboard had not yet been activated by the system administrator, so we asked them to activate it and they did. Then we tested it extensively before finally adopting it in the classroom. We have been using it since then for the formative assessment (reviews).
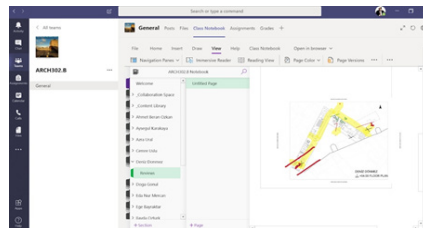

Fig. 03 Microsoft Teams integrated with Microsoft One-note class notebook

Tool	Notes	Potential	Weaknesses	URL
Moodle integrated annotation plugin	(OZ LMS) on the grade function of the assignment module of Moodle	Free, Integrated into OZ LMS (Moodle platform), allows feedback to students	Only on PDF submissions, not shareable outside of the classroom	https://moodle.org/plugins/assignfeedback_editpdfplus
Microsoft Whiteboard	Integrated into Microsoft Teams	Interactive, only drawing, shareable	Free. Cannot be recorded, cannot upload JPG or PDF files	https://docs.microsoft.com/en-us/microsoftteams/manage-whiteboard
Microsoft One-note class notebook	Integrated into Microsoft Teams	Free, integrated into Microsoft Teams, highly interactive, drawing, text, colours, shareable online	Cramped GUI, zooming is difficult	https://support.microsoft.com/en-gb/office/use-onenote-class-notebook-in-teams-bd77f11f-27cd-4d41-bfbd-2b11799f1440
Google Classroom integrated comment form	Integrated in Google educational suite, available on the assignment module	Free, integrated within the Google class environment	Comments limited to text and coloured boxes	https://support.google.com/edu/classroom/
Google Jamboard	Integrated in Google educational suite	Free, highly interactive, drawing, text, colours, shareable online, exportable to PDF	Limited to 20 pages	https://gsuite.google.com/products/jamboard/
Online Whiteboard for Realtime Visual Collaboration AWW	Now converted in Miro, see below	Highly interactive, drawing, text, colours, shareable online, exportable to PDF	Paid, free limited trial	https://awwapp.com/
Miro	The online whiteboard for easy collaboration	Highly interactive, drawing, text, colours, unlimited canvas, shareable online, exportable to PDF	Free plan with unlimited team members	https://miro.com/
Belkin Stage pro	OS and Android APP	Highly interactive, drawing, text, colours, camera, recordable	Paid	https://apps.apple.com/us/app/stage-pro-by-belkin-for-ipad/id714477455

Tab. 1 Pros and cons of different formative assessment digital tools, constructively aligning the TLAs of an online architectural design studio (Camiz, Verdiani, Özkuvancı and Alak, 2020).

Online modes of interaction and the *artistic mode of production*

Incorporating multimedia activities into online courses is essential to the teaching and learning process for two main reasons. Firstly, because it adds some colour, motion and sound to the online pages, making them more communicative than simple book pages. Secondly because it increases the interaction within the class. The different modes of interaction are one of the foundation stones of the teaching and learning process. The six modes of interaction, student-teacher; student-content, student-student, teacher-student, teacher-content, teacher-teacher (Anderson, 2003) may be considered the core of distance education, and are indeed all very useful to the teaching and learning process. The use of interactive multimedia objects can therefore bring online teaching much closer to the pedagogical effectiveness of onsite teaching. Additionally we must carefully consider not only the technicalities of multimedia content and of the corresponding tools, but also how each tool and content constructively aligns with the learning outcomes of the course.

Dealing with architecture, most of the teaching activity involves images in both vector and raster formats, and eventually videos. These formats, differently from text, occupy a whole lot of the available bandwidth, and in the case of long online meetings with large numbers of students, lead to the slowing down and often to the crash of the teaching platform. This specific character is shifting the teaching style towards a written and spoken approach in design, which is dramatically easier and faster when going across the internet. But in our opinion this tendency is not increasing the quality of the design and of the teaching. On the contrary we experimented successfully different whiteboard programmes to implement a cooperative drawn approach to the design/review process.

It was indeed quite effective in increasing the interaction during the lessons. According to recent pedagogical studies, the different interaction levels should be considered the cornerstone of teaching as a whole. But when it comes to online teaching interaction becomes the most important factor (Anderson, 2003). There is extensive research on how to establish interaction tools within the online teaching platform. But for the field of architectural design, which is quite different than teaching math or history the research is still in progress. We went through the existing literature and we couldn't find much. In the field of architectural design, the point is that architects do design and they do that with a pencil. And even though today some digital tool might have replaced the pencil itself, hand drawing still plays a very important role. But besides drawing with the pencil or with the computer, in a professional studio there usually is a continuous process of review of the drawings, which is typical of the *artistic mode of production*. So you make drawings, then you print them on paper and put them on the table, where with a pencil over a piece of tracing paper, you can annotate, change and
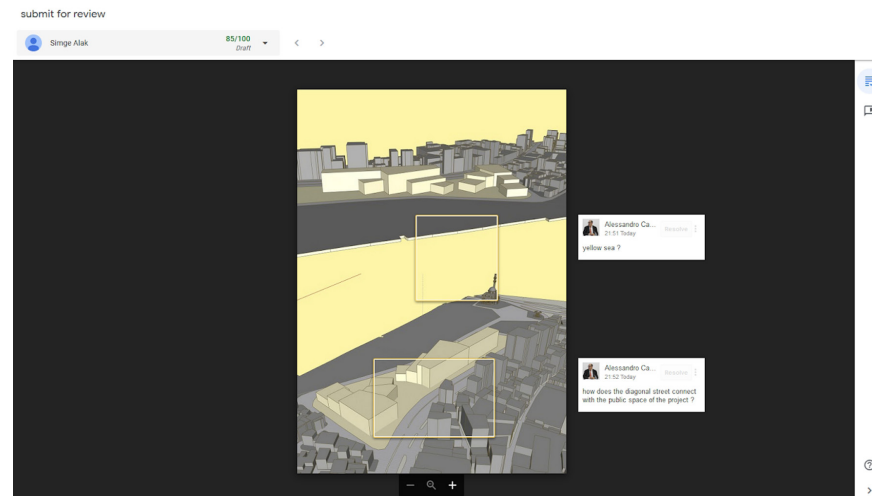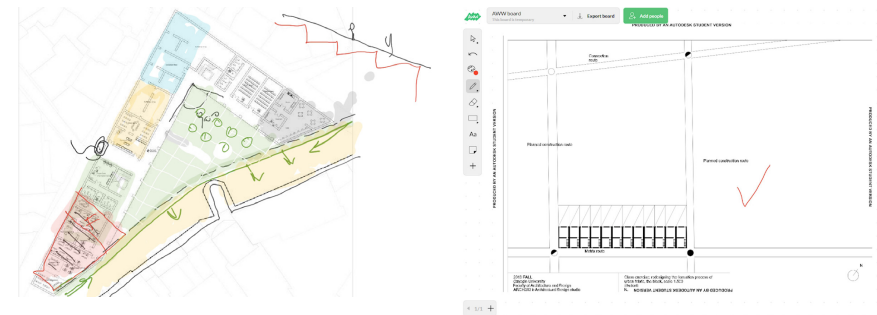
review them. Usually we simulated this *artistic mode of production* in the classroom where students printed on paper the drawings, and after pinning them on a wall, we could draw our annotations on tracing paper. This process of continuous review is what we need for teaching architectural design. When the studio moved online, we had the desk (the online conference system, Teams or Zoom), but we didn't have the pencil, and needed a replacement for that. We needed what technically is called an online shared whiteboard: a place where you can upload a JPEG and then the teacher as well as the other students can draw freehand and annotate the comments. In my opinion, comments should not be philosophical, but rather alternative architectural forms, traditionally drawn on the paper, and now drawn on an online white-board. Our studio courses are scheduled twice a week for a total of 10 hours a week. This continuous review process was deployed for some 70% of that time, with the remaining time being dedicated to lectures, tutorials, sketch exam and juries.

Online tools for summative assessment (juries)

Before the pandemics my syllabus was structured with 3 juries, when we went online I revised it to 5, 4 intermediate and one final, all with external members. For this activity we used the Miro platform, so that jury members as well could make drawn comments, but as a summative assessment it was more formal than the other formative assessment reviews. Because of the substantial difference between Miro and Jamboard. The latter can be considered the equivalent of a journal, with maximum 20 pages. Miro is instead the equivalent of a pinup wall. It has an infinite canvas and you can upload hundreds of drawings and annotate each one. So when we consider the studio jury, we got 15 students, each one of them has 8 drawings and there are 5 juries in total. We are talking about over 600 drawings, and they can be all in the same place so that people can go there with the digital pencil and make annotations. This is a very simple tool, maybe complicated to explain using words, but quite simple to draw, and indeed it was very effective in increasing the teacher-student interaction, but also essential to the design process. As far as I know, architectural design is done with the pencil at hand. But if you want to do it online, you need a digital pencil and you need to share what you're doing on the screen. So it is like drawing on the blackboard in the classroom where students are seeing what you're doing, with the main difference that students can now draw as well. So if I should compare this online way of working with the traditional one, the online way has the advantage that everyone can interact in the same way, not only the teacher. I see this as an advantage in terms of how much the student is engaged and interacts with the teaching and learning activities. If we will go back to onsite teaching, I will probably still use this interface because it allows students to interact on-screen with the project, and all the class can take advantage of the review. Again, interaction should be considered the basis of teaching and teaching.

The Distributed Virtual Learning Environment (DVLE)

During our intensive blended summer school in Italy courses[1] we used Google classroom instead of Moodle because some of our international students don't know that platform, and in ten days
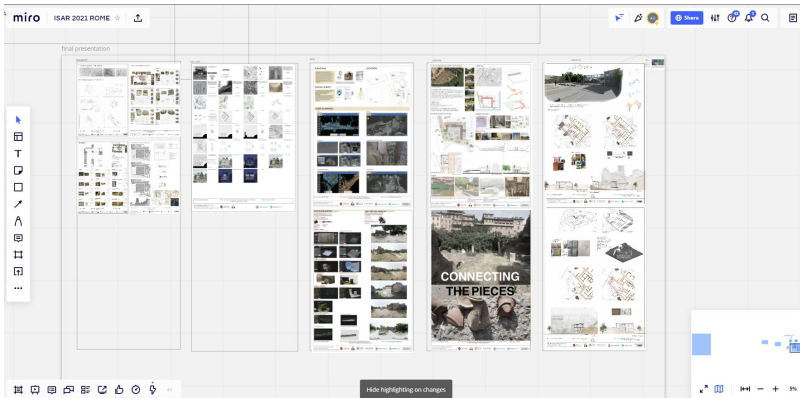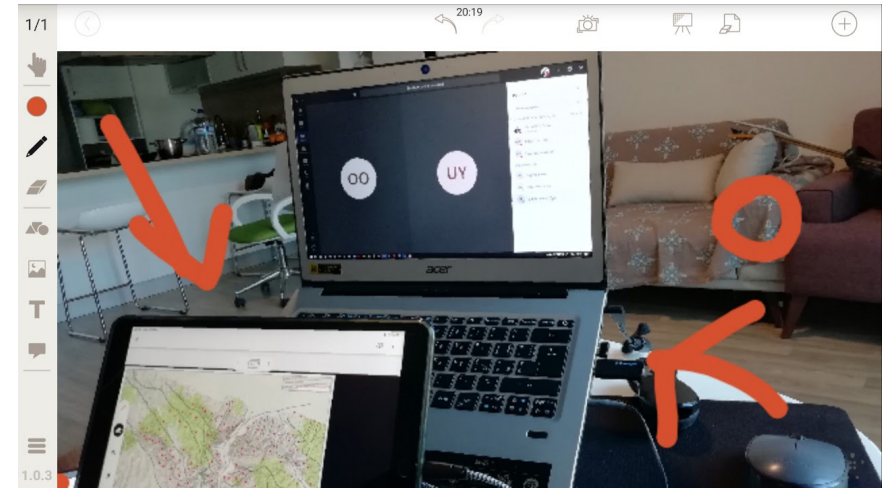
Fig. 07 Miro, best online digital tool for summative assessment in an online architectural design studio.

they don't have enough time to get acquainted with a new system. Google classroom is instead very simple to use for some purposes, and it has a high level of integration with all the other parts of the Google educational suite, such as Google Drive, email, calendar notes, keep and other external tools such as Padlet, Coursera, and Facebook etc. So as you see, we have a number of tools available. I mentioned Miro, the Google Jamboard, Moodle Learning Management System and others. We tried to put them all together in the same place, so that each one of them is taking a little piece of the *pedagogical purpose*, integrating it with the online face to face synchronous meeting, which we always record and make available asynchronously for those students that on that day we're not able to attend live. (Fig. 09). In the regular semesters and then in the summer school programmes we also experimented successfully an *online cafeteria*, a meeting platform where students could interact at any time and day, without the teacher being present. Our social purpose was to provide students the feeling that they were in presence when attending online. The university is not only including the classroom environment, but also the library, the laboratories, the department offices, the campus open spaces, the cafeteria, the park and the refectory, even the corridors. In a nutshell all those spaces where students and teachers interact full time are part of an academic environment. But when we went online we didn't have that environment anymore, so it was necessary to replace those spaces with online ones, even though it was not possible to replace them entirely, a substitute was needed. So we thought

of a cafeteria, a meeting platform where students could go at any time even without the teacher being present: a permanent space available for the students to interact, in the classroom and outside of the classroom. In the first year of experimentation (2020) we implemented that with Google meet: at that time it allowed us to schedule on google calendar a meeting with selected invitees so that they could join at any time without the owner of the meeting being present. It was basically a Google meet meeting scheduled on Google calendar for a number of days, and having as invitees the emails of all the students in a classroom. At that time, students were able to join at any time without the owner of the meeting being present. Once a student was inside, he could also admit people from outside the classroom. So if he wanted to meet his friends there, he could as well. This year (2021) we discovered that Google changed the policy for Meet, only emails belonging to the same domain of the owner of the meeting can join the meeting without being admitted. So google meet became suddenly ineffective because our staff has @ozyegin.edu.tr emails, while students do have @ozu.edu.tr. Therefore students, even though invited to the scheduled event on the calendar, needed to be admitted by the owner of the meeting. I don't know why they changed that, with no notice at all. So we had to change platform, now we are using zoom to implement a cafeteria. It is possible to schedule a meeting for a number of days, weeks, months, so that it can be joined by anyone, without the host, the owner of the meeting, being inside. This space is providing a place for informal interaction between

Fig. 08 Belkin Stage pro, versatile for operating with 3D models using pictures and videos.7
Fig. 09 A. Camiz, Distributed Virtual Learning Environment (DVLE) key-plan, 2nd ISAR International blended Architecture Summer School in Castelvecchio Calvisio, Abruzzo, Italy. June 16-25, 2021

students of the classroom and of other classrooms. In the past semester, I adopted the same Cafeteria for ARCH302 and ARCH402, plus an elective course ARCH452 and a master course ARCH610, with a total of 50 students that could go there. We shared that same space with our international summer programmes with over 100 more students, so at the end there were 150 students that potentially could meet there. And we ended up very often with friends, colleagues and students, to meet in the bar with no need of scheduling the meeting. It also happened several times that somebody went there to talk with somebody and found someone else already inside. When you go to the bar, you often meet other people. That was very fascinating. I'm an architect, and I designed before university spaces in my professional history, but suddenly I found myself having to design a virtual teaching environment. We listed several tools, such as Miro, Padlet, Google Drive, Meet, Google, Jamboard, Zoom, Moodle, Google classroom, Panopto. So we are talking of over 10 online tools for each class. Students and teachers often find themselves dealing with 4 classes adding up over 50 different links to memorize. This labyrinth environment is extremely unfriendly and very easy to get lost into. For this reason I adopted a very simple plan of the Distributed Virtual Learning Environment (DVLE), showing all the different URLs as equivalent to spaces inside a building. So that you have the entrance, the library, the office, the classroom etc. Each one of these spaces is associated with an online digital tool such as zoom, google meet, google drive, the learning management system (Moodle). All was drawn on a PDF file with little coloured boxes, each box represented as a room and clickable. So all you need to do when you are moving around in this learning environment is to click on the link to go there. We gave each room a person's name, we didn't call them Zoom or Google meet, but "Cesare Brandi" or "Sedad Hakki Eldem". We gave people names to each space following the ancient mnemotechnic suggestion provided by Giordano Bruno (1582), by associating objects to rooms or persons, it will be easier to remember them.

Conclusions: architectural design "per locos"

Student collaboration is essential to the teaching and learning process, according to the conversational framework (Laurillard 2012) it is one of the six types of learning. Therefore student collaboration should not be considered as a convenient social practice but rather as an integrating part of the learning process. But moreover, now looking at the field of architectural design, a faculty of Architecture is supposed to teach students how to be architects, not philosophers, not musicians, but architects. What do the architects do? They do projects, they make drawings for projects and then they build them. So teaching architectural design may benefit greatly from the adoption for online digital tools capable of creating the proper environment to revise those drawings systematically in order to improve them following the *artistic mode of production*. The last picture we are including in the paper as a figurative conclusion (fig. 10) is a 10 days project done during the 2nd ISAR International blended Architecture Summer School in Castelvecchio Calvisio, Abruzzo, Italy. June 16-25, 2021, and utilizing the very DVLE illustrated in fig. 09.
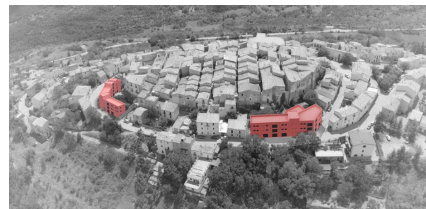

Fig. 10 Tutors: Alessandro Camiz, Özge Özkuvancı, Louai Al Hussein, Nariste Ibraeva, Yannick Mugenzi: Students: Alara Bilgen, Haneen Khalil, Yağız Eray Esgin, Ceren Gezer, Hebatollah Alhamid, Hanan Alahmad, Rahaf Shabban, Project for Anti-seismic social housing in Castelvecchio Calvisio, 2nd ISAR International blended Architecture Summer School in Castelvecchio Calvisio, Abruzzo, Italy. June 16-25, 2021.

Notes

[1] 2nd ISAR Online International Summer school of Architecture, Castelvecchio Calvisio, (L'Aquila, Italy) (16-25 July 2021); 2nd ISAR Online International Summer school of Architecture and Archaeology, Horrea Agrippiana, Roman Forum, Rome, Italy (18-27 June 2021); 1st ISAR Online International Summer school of Architecture, Castelvecchio Calvisio (17-27 July 2020); 1st ISAR Online International Summer school of Architecture and Archaeology, Horrea Agrippiana, Roman Forum, Rome, Italy (18-28 June 2020).

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Alessandro Camiz - graduated in Architecture at "Sapienza" (1999). He cooperated with Sartogo Architetti Associati for the New Italian Embassy (Washington DC), the Church of Jesus' Holy Face (Rome) and "Roma Interrotta" at the XI Venice Biennale. In 2007 he discussed his doctoral thesis (Sapienza), and therein attended Post-Doctoral studies until 2014. He taught at the Rome programme of the School of Architecture (University of Miami) and at the Faculty of Architecture, Design and Fine Arts of Girne American University, Cyprus. He is secretary general of the Cyprus Network for Urban Morphology and editor of Forma Civitatis, International Journal of Urban and Territorial Morphological Studies, Grünberg Verlag, Weimar-Rostock. Since 2018 he is associate professor and director of the Laboratory of Dynamic Research on Urban Morphology (DRUM) at the Faculty of Architecture and Design of Özyeğin University, Istanbul. His main research interests are on architectural design, typology-morphology and advanced technologies for the management and enhancement of architectural heritage. (ASN, Associate Professor of Architectural and Urban Design, 8/D1, SSD ICAR 14)