

How it Emerged that the Approach to Arts, Design, and Architecture Already Contains a Flip.

Architectural education overview

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Architectural education is open to Flipping by its very nature. Since 19th century, design studios have been at the core of very different models of architectural education. Design studios have always been always active learning environments where students learn by doing. Learning in the design studio occurs through active participation of the student in different design projects. Typically, students are presented with design problems¹ to which they need to develop personal solutions. The approaches of the studio instructors vary towards the definition of the problems, but typically there is a context, real or hypothetical people who will benefit from the design and certain needs by those people that are to be addressed. Thus, from the very beginning of their studies, students simulate how an actual architect would approach design problems. With each new design studio they develop new skills or hone the ones they have already acquired.

Such an approach immediately creates a learning culture which is based on active learning where students are challenged to take responsibility, to solve complex problems and develop their individual character as designers while being able to work in group environments. A design studio is not a course where information is given and it is expected the students learn and use that information. It is a collaborative learning environment. Students and instructors share this environment as designers with different levels of experience. It is thus interactive and a learning process for all parties involved.

Thus, following the lead of design studios, flipping theoretical courses within the architectural curriculum and making them active learning environments should be almost natural. However, this is not necessarily the case. There is a wide gap in pedagogical approaches used between design studios and theory courses within architectural education (Allen, 1997; Chiurini, 2006; Smith, 2004; Oakley, B, Felder, R M, Brent, R; Elhajj, I, 2004). Courses on architectural technology (structures, construction methods, detailing) and to a lesser extent courses on history and theory of architecture are taught in more conventional

¹ These design problems may have varying degrees of resemblance to real life problems or they can be hypothetical – either way, they are approached as a real design problem.

ways with little emphasis on the application of the information discussed (Vassigh, 2005, 2009). Within this context, it is important to find ways to develop non-studio courses as active learning environments.

Course description and goals

'Introduction to Arts and Architecture' is an introductory course into the understanding and appreciation of arts and architecture for incoming first year architecture students at MEF University Department of Architecture. The students in Turkey typically do not take courses related to the history of art or architecture during their secondary education. Thus, such an introductory course is important in order to give an early oversight of art and architectural history through familiarizing the students with major works; artists and architects as well as and concepts and ideas. A second goal of the course is to enable the students discuss those works and ideas in a critical way developing their critical² thinking skills. Another goal of the course is developing and improving the students' usage of terminology of art and architecture. Finally, the students are also expected to develop a contextual understanding of works of art and architecture.

Learning objectives of Introduction to Arts and Architecture
Familiarize the students with major works; artists and architects as well as and concepts and ideas
Developing critical thinking skills
Developing students' terminology of art and architecture
Develop a contextual understanding of works of art and architecture

The course is not chronologically organized in the sense to offer a timeline of art history but ordered as a set of discussions around a number of topics cutting through time and modes of creation. The topics and the related discussions cover vast number of cultures, geographies and time periods.

Organization of flipped content

Such a course needs to develop strategies for student engagement. More than the information given in the lectures, classroom discussion is crucial for the course to achieve its

² Another major shortcoming of the Turkish high-school system is that it is extremely focused on standardized test. Critical thinking is not necessarily encouraged nor supported in the secondary education.

pedagogical goals. Most of the information about the artists, architects and their works can be found very easily in printed or digital media with ease. Thus, it is crucial to organize the course in a way students are empowered (McLaughlin et al, 2013; Forsey, Low & Glance, 2013) to participate in discussions and are active in the classroom, so the course can go beyond familiarization.

The course is divided into two parts: before class and in-class activities. Before coming to class, students are responsible of watching a video that introduces the main ideas in the current topic, presents the main concepts through examples. When the class meets, the instructor conducts a discussion around the topic. All students are encouraged to participate. Instructor acts as a facilitator leading the discussions. There are also in-class group works conducted by the students after the discussion. These are small assignments that relate to the topic being discussed. After the group work, students present their 'solutions' to the class.

As an example, when the topic of the week is 'time', the video presents the concept of time as a possible design parameter in both art and architecture through examples. In class, more examples that are integrating 'time' in various ways are discussed. Finally, the students are divided into groups and each group is given further examples, which they need to analyze by discovering how the artists or architects have used time as a parameter. Then each group makes a short presentation and the whole class discusses their position.

The course has been conducted three times so far in Fall 2014, Spring 2015 and Fall 2015 semesters.

Fall 2014 and spring 2015 courses and results

In the first two iterations of the course, the course was conducted in a similar fashion. The students were asked to watch a video before coming to class. When the class would meet in the classroom the Instructor would present new examples of works to the classroom and conduct a discussion related with the ideas and concepts presented in the video. It was necessary for the students to have watched the video before coming to class to be able to actively participate in the classroom discussions since they were based on the concepts and ideas introduced in the videos.

<i>Fall 2014</i>	<i>Before class</i>	<i>In-class</i>
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Spring 2015		
Activity	Watch video	Discussion of concepts and works from the video Introduction of new examples and ideas followed by discussion Group work and presentation

Table 1: Before class and In-class activities in Fall 2014 and Spring 2015 courses as intended.

Fall 2014	Before class	In-class
Spring 2015		
Activity	Partially watch video	Presenting of the main ideas again Discussion of concepts and works from the video Introduction of new examples and ideas followed by discussion Some group work

Table 2: Before class and In-class activities in Fall 2014 and Spring 2015 courses as actually happened.

In these two semesters there were mixed results in the course. The main problem was that very few of the students would watch the videos before coming to class. In Fall 2014 semester on the average 25% of the students have watched the video before coming to class, in Spring 2015 that rate was 30%. In order to conduct a proper discussion the main ideas, concepts and examples that were introduced in the video, they had to be (at least partially) repeated in the classroom in order to give the students the background information so they could get involved in the discussion. That was problematic not only because of lost time in the classroom but also because the discussion could not get much deeper into the topic. Due to the lack of the foundation that should have been laid through first watching and then reflecting into the ideas presented in the videos, the discussion could not cover all the intended concepts.

On the other hand, the students were able and eager to participate in the discussions. Very few would need encouragement for participation and this was always due to a perceived lack of English speaking skills. The students were also very willing and enthusiastic to get involved in the group work and presentations.

Eventually these two courses were partially successful in reaching learning goals. All the topics, ideas and examples could not be discussed since the course moved slower than planned due to the students not watching the videos. On the other hand, the activities in the classroom were very beneficial for all of the students involved. In the next iteration of the course, some changes were made to improve the success of the course.

Fall 2015 revision and results

There were two major revisions to the course structure in order to fulfill the course objectives:

It was necessary to ensure the videos are being watched before students come to class, so the discussion of the topic can go deeper and at the desired pace. An assignment that would accompany the video was introduced for each week. Those assignments were evaluated and were part of the final grade. The students were asked to answer some questions related to the ideas introduced in the video and then to submit them through the digital learning platform. The instructor would evaluate those submissions, give feedback to the student and demand revisions if necessary. In that case, the student would further work on the assignment and submit it again with revisions. In the classroom, the discussion would then start with the discussion of those assignments.

The second revision was the introduction of homework as a follow-up to the classroom discussion. The students were given another assignment that directly relates to the classroom discussions which they had to submit before coming to class the following week.

<i>Fall 2015</i>	<i>Before class</i>	<i>In-class</i>	<i>After-class</i>
Activity	Watch video Answer questions presented in the video, upload into system After receiving the feedback from the	Discussion of students' answers Presentation of new material and discussion Group work, presentation and	Homework based on class discussion

	instructor, resubmit with revision	discussion	
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Table 3: Before class and In-class activities in Fall 2015 course as intended and as actually happened.

The assignments increased the watch rate of the videos substantially. On the average, 80% of the students would come to class after watching the video and 65% would submit their answers to the assignments. Since the students came to the class more prepared it was possible to present new examples and ideas immediately and conduct a discussion that could go beyond the ideas presented in the videos. Another main differences was that the students who are not naturally inclined to presenting their ideas in class were more involved in class discussions.

Semester	Watch rate of videos	Before class assignment completion rate
Fall 2014	30%	-
Spring 2015		
Fall 2015	80%	65%

Final words as conclusion

The course has been evolving in the last three semesters in order to use the full potential of a flipped structure. The revised course has been substantially more rewarding for the students as well as the instructor.

- It needs to be said that flipping any course seems to be a process that takes a few semesters to adjust to the specific needs of the course, pedagogical inclinations of the instructor and behavioral habits of the students. How to design a flipped theory course is itself a learning process since it seems to be field and culture specific.
- It is clear that taking the instruction out of the classroom in the form of a video and expecting the students embrace that new learning structure is not realistic just by itself. Depending on the students' secondary education culture, methods to make sure they interact with the before-class material need to be developed. In the case

of that course described, the introduction of assignments students need to do after watching the videos and before coming to class worked well.

- The flipped structure seems to be effective in an introductory theory course such as the one described here. In all three iterations of the course, students were very willing to get involved in class activities and discussions. With the final adjustments, it was observed that more students would come to class prepared. Thus, it has been possible to follow the original course plan to the full extent and reach educational objectives.
- The Flipped structure benefits the students in a theory course due to the very strong interaction between students and instructor as well as between students themselves.

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A Bridge to Dreams

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Design Build Studio in architecture education

Architecture education has at its center the design studio where students learn how to design by designing. In a typical studio, students are given various design problems or needs; a physical, social and cultural context and other restrictions. In other words, design studio functions as a realistic simulation of the actual way architects perform their profession. Thus, design studio is flipped by its nature, there is almost no ‘teaching’ but plenty of active learning. Peer learning and group work are essential qualities of such an environment where instructors have the role of mediators. When this active learning environment is taken a step further, we encounter ‘design-build studio’, a learning model becoming increasingly popular. In the design-build studio we blur the boundaries of learning and go further – by building their own designs students experience the construction process as well as the design process.

In a typical design-build studio, students are involved with all aspects of the design process giving them a complete experience:

- Finding a need. In most cases, design-build studio’s are interested in reaching out to the community, especially to the groups with less access to design services, so what is going to be built improves the lives of people. Students actively get involved with the process of finding a need in the community they are going to work.
- Interacting with the people. In order to understand how the people who are going to use (or benefit from) the design, students work together with them. That can be done in varying levels of participation.
- Design and approval. Design process in design-build studios mostly consists of group work, at times involving the community. The design is presented to the community many times at different stages and eventually as it is going to be built.
- Financing. In many cases, finding funds for the construction of the project is part of design-build studio’s brief. Students work actively in finding sponsors, giving them a valuable experience.

- Construction. With varying levels of professional help, students build their design. They experience the excitement of seeing the construction of their ideas. They can evaluate their design decisions in the light of problems – solutions during the construction process.
- During construction, local authorities and students work together in order to optimize the design.
- Publication. For the sustainability of the design-build programs, publishing the results is essential. Students learn how to emphasize the strengths of their ideas.

Design Build Studio is an integral part of the curriculum of the departments of Architecture and Interior Architecture at the MEF Faculty of Art, Design and Architecture. It brings all these diverse aspects of the design process in the studio centered learning environment of the Faculty. All students are given the chance to participate in a design-build studio.

The Pedestrian Bridge of Ayazağa Primary School – ‘Bridge to the Dreams’

Design-build studio (DBS-MEF) of MEF University aims to get students involved in the design and the construction of projects that solve problems of underprivileged groups. DBS 2015 focused on the design and construction of a bridge on a water channel that had divided the courtyard of Ayazağa Primary School (*Ayazağa İlköğretim Okulu*) into two parts. The part of the courtyard on the other side of the channel was not accessible to the students of Ayazağa Primary School which is a very big public school with limited resources. The school has about 1700 students in dual education. Through the construction of the bridge, the courtyard area open to the use of the students was increased by 100%.

23 first year architecture students from MEF University were involved in the 2015 Design-build studio. The studio was undertaken in the summer session of MEF University. The process was participatory: the students conducted workshops with primary school students in order to understand their ‘dreams’ about the courtyard; discussed the problems and needs with teachers; presented their initial ideas to the parents, primary school students and their teachers in order to get feedback as well as get the community informed and involved in the process.

The project was also crowdfunded as it was conceived from the beginning as a social responsibility project towards the underprivileged school at Ayazağa. Students were

involved in developing the necessary materials (videos, text, photos) for the crowdfunding process.

The design process started with developing ideas in small groups and then merging the strongest ideas of various projects into one design. The constraints and requirements were as follows:

- Timber would be used as the main material of the bridge to enable the students to undertake all steps of the construction
- The bridge needs to span 10 meters over the channel
- The bridge needs to be removable if necessary without much impact on the school courtyard and the existing channel
- The bridge design needs to be simple enough so it can be built with little professional support by first year architectural students, but also needs to make an architectural statement

A scheme based on two trusses was developed as the final design. The trusses have different shapes but they are both non-linear in plan as well as section. The two trusses of 10-meter spans have varying heights over their lengths. Their heights vary between 2.30 meters and 3 meters, decreasing towards the middle, defining the gateway to the new courtyard. The bridge is reached by a ramp on each side. The ramp and the narrowing space towards the center accentuate the lively crossing to the new courtyard. Like a door at its center its radiating design gives a framed glimpse of the soon to be furnished and bustling courtyard.

The assemblage of the trusses constituted one of the major steps of the construction. Their production proved to be very challenging under the very simple and non-professional construction conditions in the site. The students had to learn all the basic skills that are required in order to build their design: how to apply their design which is on paper on the site; how to make precise 1/1 scale mock drawings so the timber members can be built; how to use a saw; how to temporarily connect timber pieces until they are fixed by bolts and nuts; how to use a driller. Beyond these practical skills, they also learned about how to coordinate work in a construction site; how to deal with problems occurring in the construction; how to deal with co-workers of varying skills.

Following the hand sawing of all timber members, the trusses were assembled on the

ground. The completed trusses were lifted by a large crane and placed on their reinforced concrete foundations that were built with the help of Sariyer Municipality. The construction team of the Sariyer Municipality supplied professional guidance during the construction of the floor of the bridge. That was one of the many contributions to the project by individual donors and firms either in financial terms or in materials or workmanship. By the completion of the bridge, the Sariyer Municipality has cleaned the channel and organized existing green areas. For the DBS 2016 at the same plot, MEF University Faculty of Art, Design and Architecture is now in cooperation with the Municipality to organize the school courtyard and provide various amenities and play areas.

The bridge is in use since November and is one of the favorite spots of the students at the junction of the two sides of the school courtyard. As envisioned at the beginning of the project, the bridge will also be a milestone to convert the school courtyard as a livable and joyful place for the students. We all hope the planned projects to be completed soon to convert this once concrete court into a resourceful and entertaining place for the development of the children.

Based on the success of the project, the design-build studio program is expanding at MEF University. In the summer of 2016, we will conduct 5 projects of different scales including two at the Ayazağa Primary School.



Learning the basics



Application of the truss 1/1



Hard work



Taking shape



Bridge in use



Before and after MEF Design Build Studio 2015

