

DESIGNING BY STUDENTS FOR STUDENTS: AN EDUCATIONAL ROADMAP IN THE DESIGN OF UNIVERSITY CAMPUSES

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Abstract

The increased emphasis on the environments contributing to people's well-being has prompted a more profound contemplation within university settings. Prioritising both physical and mental well-being has compelled universities to take decisive actions to ensure the welfare of students and all staff members.

The Laboratorio di Sintesi Finale (LSF) of section I1 is explicitly predicated on this premise. This course, the final design laboratory of Politecnico di Milano's three-year Interior Design degree program, gives the 57 enrolled students the chance to work on a project that will serve as the focus of their thesis. Students are expected to design spaces on Politecnico's three campuses in Milan to maximise the user experience of events and services. The intention is to engage students in working on permanent or temporary locations, as well as dedicated and interstitial spaces, both indoor and outdoor.

The faculty team is multidisciplinary and includes professors and specialists from architecture, interior design, product design, and materials expertise due to the diversity and scope of the work. Giving students the assistance they require to effectively present their research and projects is crucial. Consequently, the LSF aims to give students practical tools for analysing design problems in the larger framework of cultural, social, and technological changes (discoveries, new lifestyles, and new technological scenarios). Students have to develop an interior design project that narrates and represents their ideation process using a range of methodologies and digital and non-digital media. During the research phase, the students must design printed layouts, videos and presentations to represent their project; at the same time, they collect case studies on preset boards that summarise the analysed projects and artefacts.

The expected results are an in-depth representation of the research analysis and a description of the concept phase. The final documents must include technical and analytical aspects, mainly in hard copy, and emotional and conceptual elements, represented through videos. The case studies have been explored in depth in several course steps and are a reference throughout the design phase. The rules provided for the layout and organisation of the material make it possible to obtain coherent papers in proportions and format for the final exam.

Upon completing the course, students have comprehensively understood interior design, material selection, and practical guidance on crafting and editing a thesis. This has equipped them with a method for effectively representing and communicating their projects.

Keywords: education, interior design, case studies, university campuses, public spaces, communication supports.

1 INTRODUCTION

Following the pandemic, there has been an increased discussion on human spaces [1]. Initially, the debate centred around the domestic environment. Subsequently, with the resumption of in-person work, there has been a growing imperative to enhance the functionality and hospitality of public spaces [2]. The study of the dynamics of public spaces has involved the working and educational environments. Specifically, the reflection has been on permanent environments such as university campuses.

The sudden change that inevitably involved the relationship with places of education and modes of study forced institutions worldwide to review their priorities, defining new challenges focused on people's well-being [3].

The main dynamic facing universities concerned the need to find new methodologies that would be able to restore their internal balance while proposing a model that could adapt to what was happening externally [4].

As known, the pandemic has undoubtedly accelerated the adaptation to new technologies by universities around the world. Still, it has also led people to reflect on the importance of physical interaction with other people and the space around them. Indeed, space is commonly associated with indoor environments where studying and work are the main functions, but the significance of outdoor spaces should be considered.

Most unplanned social interactions occur within these outdoor areas, and these connections contribute significantly to a person's valuable campus experience [5].

In the past few years, there has been an understanding of the importance of ensuring constant access to these areas, emphasising their need for utmost flexibility to align with the university's comprehensive approach to campus life.

It is essential to acknowledge that modern universities are dynamic entities capable of adjusting to the needs and preferences of various generations of users. Consequently, the concept of university campuses needs to evolve into a "living system" featuring adaptable structures that can respond to future, sometimes unpredictable, conditions and requirements [6].

Considering the current thinking on university campuses, the Politecnico di Milano has formulated its Strategic Plan 2023-2025 [7]. This plan underscores the scarcity of spaces for education, research, and social activities. Furthermore, the University expresses its intention to revamp its campuses by incorporating elements that enhance overall liveability and attractiveness, as well as flexible, adaptable and welcoming spaces and areas for socialisation. The Politecnico di Milano aspires to be "a solid, recognisable, and reliable reference point for sustainable development in Italy and Europe" [7].

The Strategic Plan has the task of defining and illustrating the development policies adopted by the university for the next three years, outlining the guidelines to be followed and the horizons to reach. This is a sustainable growth that the Politecnico di Milano is committed to continuing. The ultimate goal is not really to think about and design new spaces but rather to "reread and enhance existing spaces to adapt them to new teaching models, to the needs of an increasingly multidisciplinary research of excellence, enhancing the experience in the university, promoting moments of meeting, creating and sharing ideas" [7].

Working in tandem with the expansion of the Bovisa Campus and existing initiatives, the University's essential need is to provide valuable services that make the settings accessible, safe, and comfortable. To achieve these objectives, the Athenaeum adheres to the principles of the New European Bauhaus [8]. The project intends to integrate the European Green Deal [9] with the areas we live in daily and our experiences, with the ultimate objective of building future ways of living that maintain harmonious interaction between places and people.

As a result of laying these foundations for Politecnico di Milano's strategic development, it is necessary to experiment with innovative teaching models, not only intended as spaces for face-to-face learning but also as places where relational activities can take place.

Therefore, campus spaces must encourage different modes of interaction and adapt to the needs of other users. Working on a hybrid and interdisciplinary offering is critical to bringing more interactive processes closer to users and rethinking standard lecture delivery techniques [10], [11].

Within this general framework aimed at the sustainable growth of the University, the students of the LSF of the bachelor's degree course in interior design are asked to design spaces and services that improve the enjoyment of the three campuses of the Politecnico di Milano (Leonardo, Bovisa Durando and Bovisa La Masa). Not only permanent and temporary spaces but also dedicated and interstitial spaces, indoor and outdoor, for sports, study and flexible work.

What must result from the design of such environments is to incentivise students to stay on Campus and enjoy it throughout the day, as already expressed in the Politecnico di Milano's Strategic Plan. All while paying close attention to the human requirements of individuals who live in these locations daily: students, teachers, the broader polytechnic community, and citizens.

2 METHODOLOGY

2.1 Course structure

The primary aim of the LSF of Section I1 was to guide the students toward a deeper and more conscious understanding of the indoor and outdoor spaces that they experience and observe within their university campus every day. These spaces, whether permanent or temporary, may require various targeted interventions based on their purpose.

The course was structured into three macro-phases that helped students define a unique and successful project:

- Analysis and collection of case studies
- Concept development
- Project development

Firstly, students conducted a careful research analysis of the chosen space, starting from studying their most evident and noticeable characteristics and progressing to uncovering more hidden aspects. The primary focus centred on the distinctive elements of the spaces, involving comprehensive research into their territorial, logistical, and sensory dimensions.

Then, students identified some case studies with similar characteristics, functions, and purposes to the locations under scrutiny [12]. By selecting and analysing a range of case studies - within and beyond the university campus - students enhanced their understanding of existing projects. They selectively extracted features and functionalities from these studies, which they then adapted and applied to their projects.

Following this meticulous analysis phase, students developed a concept and design proposal to lay the groundwork for the realisation of their final project. The projects must meet the primary requirements of the spaces as defined in the previous research phases and address the needs of the users inhabiting and utilising these spaces.

Throughout the course, students were guided and assisted in the various project development phases by a multidisciplinary team of professors and experts in architecture, interior design, and product design.

These interventions [13] aimed to bring a more practical and realistic perspective to the theory taught in the classroom by exposing additional aspects related to specific design experiences that were added to the teaching material already present. The combination of professors and outside professionals in the field contributed to the development of different points of view that led to a more comprehensive and critical understanding of the topics covered. During these talks, students could ask questions about projects they were working on and any uncertainties they might have during the creation process. Subsequently, students could put the ideas developed during the lessons into practice by tailoring them to the needs of their projects.

Several course lessons emphasised the importance of materials and technologies in the dynamic design field, which is marked by continuous evolution that requires designers and students to always be up to date with the latest advancements. Indeed, materials play an essential role in the design world, as they influence a product or environment's functionality, sustainability, durability, and aesthetic appearance [14],[15].

Abet Laminati [16], a prominent manufacturer of ornamental laminates with an extensive presence in over 90 countries worldwide, was invited for a guest lecture to show how effectively the brand intervened to support this need. The company has developed materials capable of interpreting contemporary-style evolutions and revolutions. This intervention gave students a more complete and specific view of the world of high-quality laminates and materials that can cover various applications. They can be used in both the world of interior architecture and furniture. Related to the project on college campuses carried out by students, laminates could be used, for example, as wall and floor coverings or, more specifically, as solid and durable countertops.

On a different note, the progress in using artificial intelligence has also been noticeable. This technology, which has gradually permeated various disciplines over the years, proves increasingly effective, particularly in design and architecture [17], [18]. Designers can optimise and accelerate the design process through its use. It is possible to generate targeted schemes, layouts, images, and inspiration for any project through specific inputs, thus obtaining more focused and engaging solutions [19]. The lecture on artificial

intelligence was crucial to ensure that students understand how to use these new research tools more clearly and meaningfully. The class was also particularly engaging as it was possible to directly experience the use of specific software under the supervision of a subject matter expert.

Finally, through the different experts' contributions, the various components that constitute a design project were highlighted for students to determine the effectiveness and validity of their works.

2.2 Tools and support

Students received resources and help for presenting the project at every stage of the course. This paper will concentrate on the workshop's initial phase, during which various tools were available to collect data about the context and location. Since they had to design environments for users similar to themselves, it was necessary to encourage students to understand that the needs and realities around them should be considered objectively rather than based solely on personal preferences.

In the first phase, crucial for establishing the project's boundaries, guidance was given on three main strands of analysis and research development. The first step involved setting up field research through guided observations. Then, a collection of case studies was started. Lastly, the students received guidance regarding communication and representation.

2.2.1 Field research

A first phase of the project research consists of field research [20] at the project site to observe everything that happens there. The first part of the observation was collective - the teaching team organised class visits to the different campuses. The students could observe several familiar and unfamiliar places and assess what could become the object of their work.

Once they had seen all the campuses and established the different focus areas, the different methods of analysis and observation were presented [21].

The first step was photographing the area of interest, trying to capture the characteristic elements of the chosen location. Thanks to students' prior years' work, the students learned possible interpretations of textures, materials, people, forms, and other elements to consider when doing this analysis [22].

Once this first part had been completed, the second step was to enter and "invade" the balance of the place, interacting with the other students and figures that fit into that context. The students could do surveys and interviews [23] to broaden their understanding of locations, people's experiences, what occurs there, and most importantly, what is lacking.

In the end, they could express further the subtleties captured only after a more thorough and deliberate study of the project object through a final photographic report.

2.2.2 Case studies

Unlike the first one, another part of the research had to be done as desk research, looking to academic and grey literature [24]. The case studies collection was preparatory for the project conceptualisation and development work [25]. In the first part of the research, the students researched eight examples relating to their project idea, divided as follows:

- Two concerning spaces on literature campuses
- Two concerning generic, non-campus spaces
- Four other free references

After comparing the chosen examples with the professors, each student delved into four case studies, one for the first two categories and two for the last.

In this way, the examples deepened and analysed in detail and became references for the project.

In both cases, the professors provided the students with templates of analysis sheets with the primary information to be examined. When an example becomes a case study, the example's template becomes the cover sheet of the case study itself.

The template provided the following information: title/name, type of project, year, location, designers, interest (what aspect may be of interest for the research), source, and images.

From this collection, it was possible to create a pool of information and references helpful for the project that the students could exploit during all designing phases.

2.2.3 Communication

Templates and guidelines were also designed to support the students in a critical part of the project, namely the presentation [26].

The primary communication tool of the project is the book. At the end of the course, this will consist of three parts: the group research carried out in the first phase, the couple project carried out in the second/third phase of the workshop, and the individual project further developed after the course for the degree examination. Students can choose the books' layout, graphics, binding and size. The necessary condition is that the selected size proportions are those of an A4 and that the dimensions and the graphics are consistent for all three volumes. These simple rules allow students freedom of expression while having a scalable and coherent format for events or publications.

The second tool for representing the research is video [13]. The students had to shoot a one-minute video describing the project concepts. The selected size was 1920x1080, and an initial cartouche was given. The students were free to experiment with both graphics and directing.

In addition, the teaching team requested prints of all example sheets and case studies.

After the research phase, on which this article focuses, the students were asked to submit an extra document: some A1 summary board of the project. The students represented on the board the updated case studies, project explanations, dimensioned plans, and sections.

For the final delivery, a material board was requested to collect samples of the materials used in the project to complete the description and communication of their work.

3 RESULTS

The conclusive results of the research phase consisted of 10 concepts for improving university life through design interventions.

Starting with deep research into university spaces, collected in the book, provided the students with a solid awareness to start the creative elaboration of their project.

The following are some examples of projects developed by the students to show concretely the design approach explained above. The selection was operated by choosing content different in themes and application sites.

As mentioned above, Politecnico is divided into multiple campuses. Those in Milan are located in the areas of Leonardo and Bovisa; Leonardo englobes its buildings in a unique system, whereas Bovisa is divided into Campus La Masa and Campus Durando.

Within Campus Leonardo, the attention of group 9 (G9) fell on an area less connected to the others, which students perceive as difficult to reach.

The method they applied started with a survey among a sample of students who are assiduous users of the area, intending to understand their project target's habits, needs, and behaviours. Further research analysed the public transport connecting the area and the level of illumination of the streets. Finally, they created an empirical diagram of the acoustic environment of the campus, observing and gaining awareness about the difference in noise levels between areas with more and fewer services.

The analysis outcome was concretised in a clear project solution: redistributing the flow of students homogeneously all over the campus instead of relegating most of the services to a few areas. In Fig. 1, the final concept was then summarised in the title "Closer," which includes bringing campus pavilions closer by working on interconnection spaces and bringing the surrounding realities closer to the university for mutual benefit.

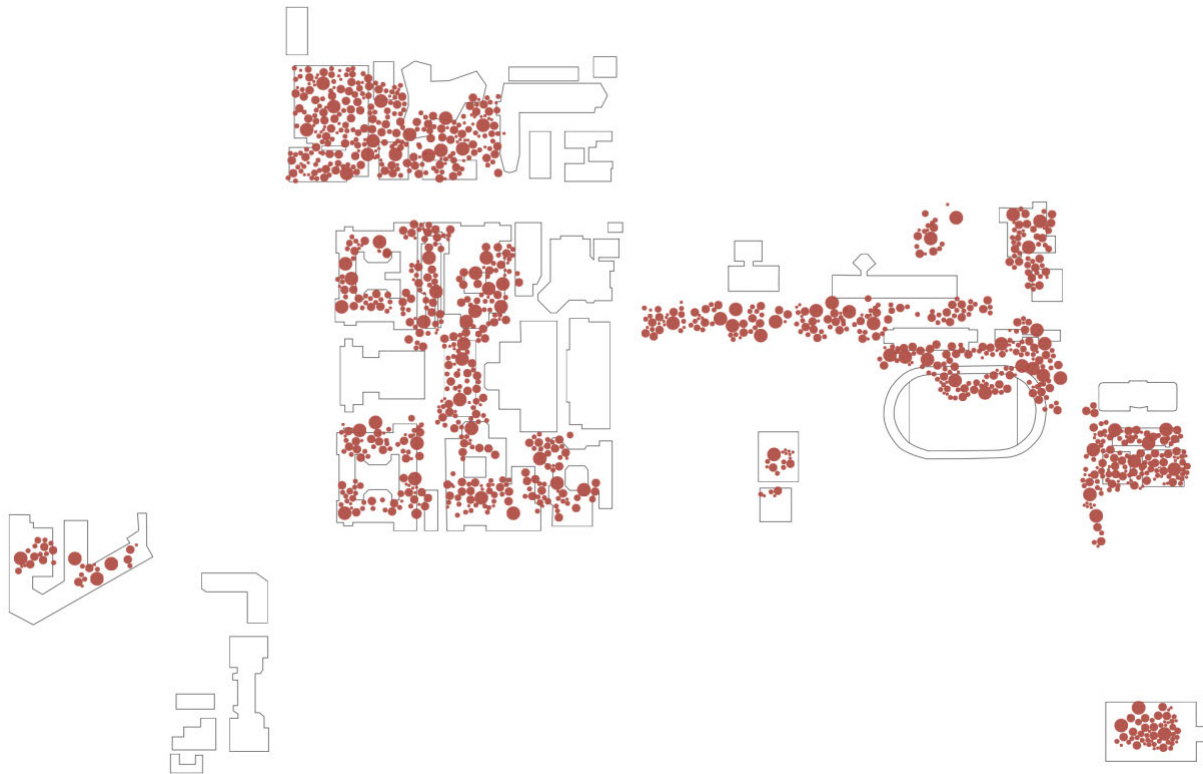


Figure 1. Fluxes expected in the project (right), G9.

All this information was collected and delivered in the project book, whereas the video creatively developed the concept of distance. The video was structured as a handbook about how to self-create new spaces in the university environment by varying distances following proxemics rules. In Fig.2, the abstraction of the theme in developing the video was not a specific request.



Figure 2. Frame from the video (0:32), G9.

Still, the freedom to choose their narrative allowed the students to experiment with a media that they declared not to be familiar with while pursuing the objective of enlarging the understanding of the theme of their project.

The third submitted material was the case study book, in which the students collected 12 scholastic and university spaces and 12 other references - works and design philosophies (Fig.3).

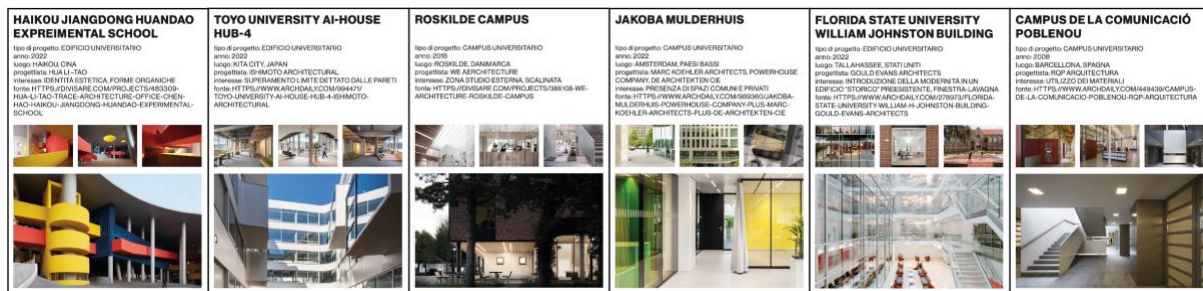


Figure 3. Some case studies extracted from the G9 book.

Another fascinating project was conceived for campus Durando, in which the Design department is based and, therefore, the most frequented by the students of this course. Group 7 (G7) identified an interesting analogue problem on this site. Also, in this case, the centre of attention was the theme of “connection.” The whole project developed on an imaginary line connecting two university buildings (B2 and B1) and a park belonging to the municipality of Milan included in Politecnico’s fence, Fig.4.

Taking a survey of a sample of students frequenting the campus, the group found that the interior areas were more functional for studying than the external ones. However, many interviewed people demonstrated a solid propensity to spend more time studying and working in the exterior areas. The project was then developed to stimulate the reciprocal exchange between interior study spaces and exterior areas now dedicated only to pic-nic and sports activities.

The students developed extensions of pavilions B2 and B1 through modular structures that can be positioned outdoors, conceived as a prolongation of the interior spaces, and allow users to carry out collective study and work activities in external spaces. The result is a connective line that alternates covered and uncovered areas that ideally extend the "polytechnic city" into the City of Milan.

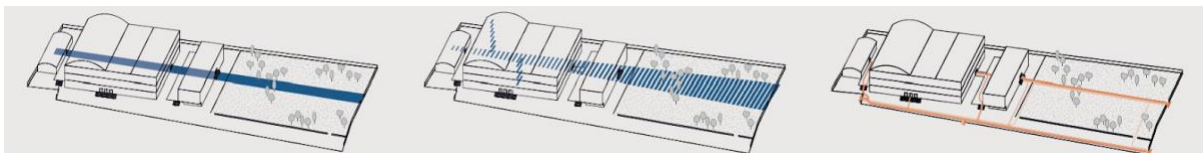


Figure 4. Line in which the project is developed, G7.

Adaptable modular structures were also conceived in the project “SYSTEMO”, by group 6 (G6), based on the need to integrate many spaces with new functions.

In this case, the destination areas are all the campuses of the Politecnico di Milano; the structures, distributed where necessary, would also constitute a sign of aesthetic recognition of a familiar brand ID in areas with different stylistic connotations.

Through its analysis of the campuses, the group identified many spaces with great potential that are now implied only as transit spaces but could become functional for other activities with a small intervention. The students' project answer to this problem of “spaces without an intended purpose” was to create a modular structure that could be inserted into different kinds of areas and activate them for new functions.

The project was visually described in the requested A1 board and integrated with A5 cards explaining the modular selected furniture and their dimensions, Fig. 5.

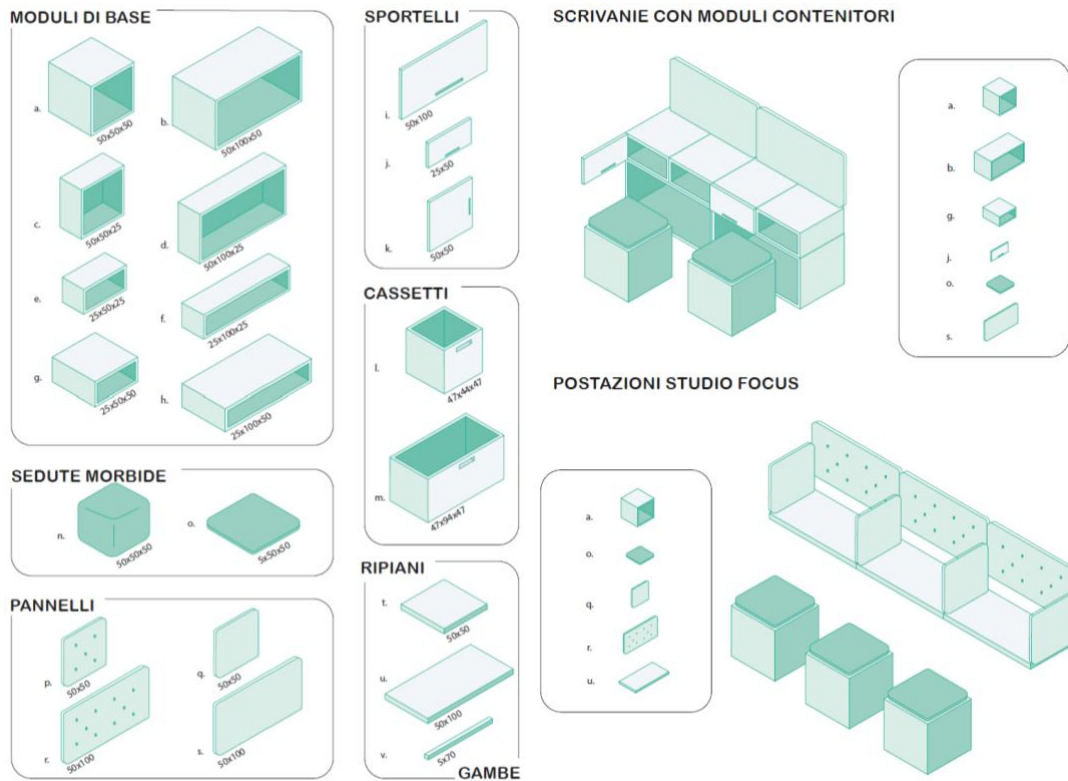


Figure 5. Two extracts from the A5 cards, G6.

The project's claim is "Everything ok, nothing in order," and was visually interpreted in the short concept video. The students chose to work visually on the metaphor of a university table, which is realistically used for many activities, such as studying, prototyping, snacking, having lunch, and drawing. In the first part of the video, the table is chaotically occupied by objects functional for the abovementioned activities. In contrast, these objects are organised in the second part following geometric and spatial logic, as showed in Fig. 6. The impression is that a living and energetic environment needs discipline - a proper project - to function efficiently.

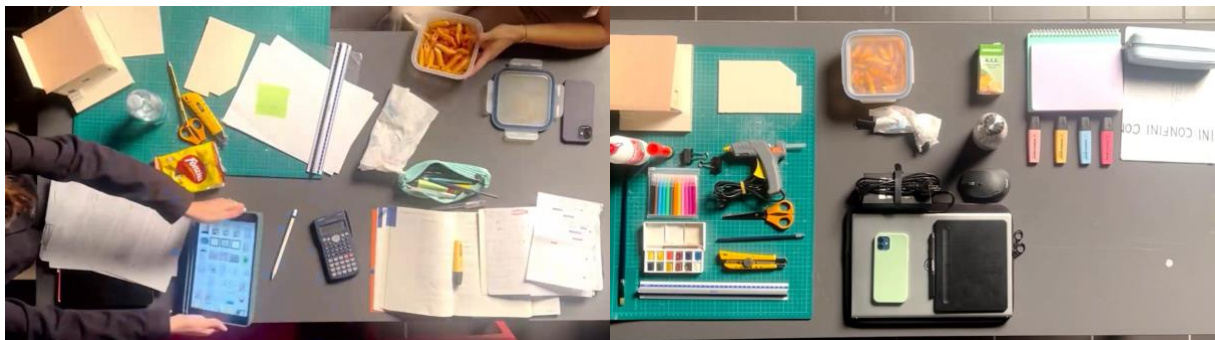


Figure 6. Two frames from the video (0:19 e 1:07), G6.

4 CONCLUSIONS

By looking at the general results of the class, we can ascertain that the materials requested were functional to the students' design process; through the analysis process and the representation of the data in the book, almost all the groups have identified a problem in the spaces of Politecnico and generated their own "project question" to answer.

It was confirmed that the rules provided for the layout and organisation of the material made it possible to obtain coherent papers in proportions and format for the final exam. Moreover, we acknowledged that the case studies requested in the first and second assignments accompanied the students in the design

process with a concrete and conscious approach to existing projects. Finally, the students had to concretise their reasoning and ideas by giving them a visual form on the board.

In retrospect, it was noticed that the contribution of the conceptual project and graphic representation was much more in line with the aptitudes of the class, which therefore delivered valid projects in functional and aesthetically pleasing graphics. At the same time, the video consisted of a more basic elaboration, especially from a story-telling point of view. Despite this, the creative and experimental approach with which the video contribution was designed is interesting, albeit with limited means of implementation.

Finally, the requested materials have been sufficient to give an overall vision of the projects. They are valuable for the didactic process, as they touch on the project's context, reasons, objectives, concept, and preliminary design rendering of the idea.

At the end of the course, with the theoretical input on interior design, material selection and practical guidance on writing and editing a thesis, the students acquired a method of representing and communicating the project.

Moreover, being graphically consistent, all the documents are also ready to fit coherently into a possible format for an exhibition.

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G9: Allorini Elisa, Caldarella Rosanna, Cuttica Alessandro, Lirak Lila, Marangoni Marta, Zappa Alessandra

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