

# An Explorative Tracing Of Peer Learning Dynamics In A PBL-Oriented Design Engineering Education

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**ABSTRACT:** Facilitating deep, sustainable, and long-term learning is not a trivial matter. It is a core challenge in the educational processes aiming at sculpting the profiles of future designers with ability to take part in tackling the pluriverse crisis of climate, biological and social aspects we are facing as a collective. In this context, the paper aims to provide a rich situational insight into peer learning dynamics of a problem-based learning (PBL) architectural education in Aalborg at the Department of Architecture, Design and Media Technology (CREATE). We specifically focus on the concept of peer learning within design education that tackles design issues, which are typically referred to as 'wicked' matter of complex proportions that needs addressing on a cross-disciplinary level. Previous research discusses the processes of designing as both linear and situational combining the tasks of analysis, problem formulation, solution, and evaluation showing how working analytically and design-oriented at the same time remains a focal core of the educational process of training designers. However, working in smaller groups addressing wicked design problems introduces also matters of collaboration, decision-making and communication as important skill sets. To contribute insights, the main research question is the following: "How can the didactical practice of peer learning in groups in architectural education contribute to address wicked design problems? Furthermore, what are the potentials and challenges of group work in the process of design?" The paper outlines firstly the state-of-the-art and theoretical foundations. Secondly, empirical material from teaching at CREATE including firsthand insights into design processes is presented. Finally, the paper concludes with a critical discussion on the didactic potential of peer learning in a design education.

**KEYWORDS:** peer learning, architectural education, problem-based learning, tools for designing

## INTRODUCTION

The world itself becomes a place of study, a university that includes not just professional teachers and registered students, dragooned into their academic departments, but people everywhere, along with all the other creatures with which (or whom) we share our lives and the lands in which we – and they – live. In this university, whatever our discipline, we learn from those with whom (or which) we study. The geologist studies with rocks as well as professors; he learns from them, and they tell him things (Ingold 2013, 2).

The opening quote by emeritus professor of social anthropology at the University of Aberdeen Tim Ingold encompasses a generosity towards the environment that surrounds us all. A generosity characterized by the understanding that both human and non-human actors have something to offer in terms of learning – that all possesses agency. In the quote Ingold uses the rock as an example of material with which we learn and learn from. In the fields of Architecture and Urban Design, we study the design of buildings and urban environments. This caters for a multi-disciplinary focus with the designer performing on the one hand a creative and future-driven practice (asking what could be) and on the other hand a synthesis-oriented practice deeply rooted in an understanding of the problems at hand, that draws on various related disciplines such as landscape architecture, planning, architecture, engineering, sociology and geography.

Facilitating deep, sustainable, and long-term learning that sets candidates free to imagine other futures is not a trivial matter. It is a core challenge in the educational processes aiming at sculpting the profiles of future designers with ability to take part in tackling the pluriverse crisis of climate, biological and social aspects we are facing as a collective (Bjørn et al. 2023). Specifically, the architectural education at the department of Architecture, Design and Media Technology (CREATE) at Aalborg University involves group-based work and problem-based pedagogies as two central didactical pillars (Servant-Miklos 2020). This results in a learning environment with collaboration, communication, and responsible and robust learning strategies as the main vehicles for growth where peers play a central role.

In this contribution, we focus on the concept of peer learning within design education that tackles design issues, which are understood typically as a 'wicked' matter of complex proportions that needs addressing through cross-disciplinary competences. In this context, the paper aims to provide a rich situational insight into peer learning dynamics of a design-oriented education at CREATE based on problem-based learning didactics. To contribute insights, the main research question of this contribution is the following: "How can the didactical practice of peer learning in groups in architectural education contribute to address wicked design problems? Furthermore, what are the potentials and challenges of group work in the process of design?"

To this end, the paper offers rich empirical material on the design processes that takes place during group work at respectively the master's program of architecture and the bachelor's level of urban design at Aalborg University (AAU) collected during 2022. The material comprises questionnaires and qualitative interviews mixed with visual documentation of the different tools that are activated throughout the design process. The paper outlines firstly the state-of-the-art and theoretical foundations. In a second part, empirical material on the design processes as well as the usage of different tools for designing are presented. Finally, the paper concludes with a critical discussion on the didactic potential of peer learning in an architectural education in the context of the Aalborg model to support sustainable and deep learning and enable proposing design scenarios for a resilient future.

## 1.0 BACKGROUND AND THEORETICAL UNDERPINNING

### 1.1 Problem-based learning at Aalborg University

Specifically, and uniquely Aalborg University has a strong tradition working with problem-based pedagogies (Savin-Baden 2020) defined in the 'Aalborg model' with the pedagogical model 'problem-based learning' or PBL (Servant-Miklos 2020). PBL is anchored firmly within project-oriented group work where larger cohorts of students are placed into smaller groups of peers, with whom they collaborate closely throughout the course of a semester. The groups take responsibility for their own learning based on the defined learning requirements specified within the curriculum per semester directed at tackling society's current and relevant problems. This demands a high degree of self-direction and independent planning of tasks, which adheres to the ambition of educating independent critical professionals (Aalborg University 2015). The idea of "learning with problems" (Servant-Miklos 2020) thus demands skills and contentious self-direction in a peer learning setting in which students learn "with and from each other" (Falchikov 2003).

### 1.2 Peer learning approach

In architectural education previous pedagogic strategies were influenced by the idea of direct mentorships where knowledge seeps down from star architect to star prodigy (Steinø et al. 2012). This approach has been criticized due to its steered and directive character leaving only little space for independent innovations and since sought replaced by more dialogic-oriented pedagogies – peer learning being a central example of this that inserts dialogue instead of instruction (Nicol and Macfarlane-Dick 2006; Núñez-Andrés et al. 2022) and emphasizes analogic rather than canonic approaches to design (Steinø et al. 2012). A dialogic-oriented pedagogy entails learning taking place through interactions with peers driven by mutual curiosity rather than relations defined by fixed instructor and student roles and the underlying hierarchies to be found there.

Literature on peer learning specifically defines it as "students learning from and with each other" (Falchikov 2003, p. 3). The underlying idea stemming from dialogical pedagogy that emphasize the potentials of engaging students in open classroom dialogues that develop their mental capacities (Cui and Teo 2021). Peer learning may take place within the singular project group via discussions, meetings and the planning and division of tasks (in the following defined by the near-peer group) as well as between two groups on the same semester working with same project site and assignment or within a smaller segment of the semester's body of students or the entire semester body. It may even be facilitated across different semesters within the same education (Falchikov 2003). Existing literature on peer learning in groups characterizes it as widely self-organized which demands of the students being active and engaging in taking responsibility for their own learning trajectory with the aim of training critical reflection and stimulating self-confidence as a professional which enable the transferal of competences into a variety of situations.

The acknowledgement of the potential embedded within learning alongside and via student peers is widely described (see for instance Falchikov 2003; Cortright, Collins, and DiCarlo 2005; Hattie and Timperley 2007; Boud and Molloy 2013). One of the acknowledged outcomes of peer learning is the stimulation of student's ability to reflect and communicate their reflections in front of their peers – in that way rehearsing analytic skills (understanding what I am presented with) and their reflections on how something may be improved or adjusted (Pelsmakers et al. 2020; Núñez-Andrés et al. 2022). The latter requires abstract thinking that activates prior knowledge and encourages the transferal and application of that knowledge to the current situation and assignment at hand. By extension, the reflections stimulated by being presented with and reacting to the work of others, in several ways have the possibility to influence the student's own project development. This is referred to as a self-regulatory level with the possibility of adjusting behavior and ultimately affecting self-esteem as a learner (Nicol and Macfarlane-Dick 2006).

More critical points related to peer learning address issues of ensuring the relevance and quality of the provided feedback, discrepancy between the expectation and experience of a specific learning situation (e.g. a pin-up or supervision session), the required facilitation of a safe peer to peer environment, as well as the supervisor, educator or instructor automatically being regarded as the main authority by the students thus circumventing the purpose of inviting in other peers (Falchikov 2003; Turner 2021).

Essential for the peer learning situation is a sensitivity towards dialogue and reciprocal peer-peer learning (Pelsmakers et al. 2020) which demands particular attention towards the act of feedback. Constructive feedback is described by Hattie & Timperley (2007) as equally particular and context-specific asking questions such as: where am I going? (what are the goals?) – also called process of feed up; how am I going? (what progress is being made toward the goal?) – also called process of feedback, and where to next? (what activities need to be undertaken to make better progress?) – also called process of feed forward.

The good feedback practice is also discussed by Nicol & Macfarlane-Dick (2006), who outlines seven principles that foregrounds how feedback should have a clarifying character and stimulate reflection, while they also emphasize that feedback provides the instructors with new insights that are beneficial in shaping teaching activities onwards.

Hattie & Timperley stresses how feedback has no influence in a 'vacuum' but harbors agency if there is a known 'learning context' within which the feedback is situated (2007). They refer to this context as a continuum between instruction and feedback, which require a clearly stated purpose and description of the contextual setting for the peer learning and thus feedback situation, that secure alignment of expectations and a sense of clarity for all involved. In correspondence, several researchers point to the importance of recognizing that feedback is never only a one-way transmission of information but rather a situated and relational disciplinary practice (Carless et al. 2023). Instead, they argue we should rather prompt

a view on feedback as an interactive process that unfolds through social encounters between course participants and resources (ibid., p. 1159).

### 1.3 Design processes and wicked problems

The drive towards finding a situated, sustainable and innovative solution to a specific design problem at a particular site, lies at the core of the education at AAU (Aalborg University 2015). Several researchers have engaged in discussing the process of designing. Donald Schön, Bryan Lawson, Nigel Cross and Mary-Ann Knudstrup and Ring Hansen are well known within the field (Schön 1968; Lawson 2006; Cross 2007; Knudstrup 2004; Hansen and Knudstrup 2005). The latter being the authors of the IDP model (Integrated Design Process) that is central for the PBL work which takes place at CREATE. Some processual models of design processes are almost linearly portrayed, albeit the underlying importance of iterations between phases of analysis, design and synthesis is emphasized (Hansen and Knudstrup 2005), while others are situational (bordering deconstructive) with tasks of analysis, problem formulation, solution and evaluation unfolding in parallel over time (Lawson 2006) underscoring the complexity of working analytically and design oriented at the same time. One of the central take-aways from these sources is however that design processes are both intuitive and iterative as well as informed by site specific factors. By extension, it is frequently emphasized (see also Williams, Ostwald, and Askland 2010) that the imaginative and creative process of form giving is something which is hard to describe and outline in a step-by-step guide. Doheim and Yusof (2020) even posits that students in design studios have different experiences than students inscribed in other 'theoretical courses'.

In this contribution, we specifically focus on the concept of peer learning within design education that tackles design issues, typically understood as a 'wicked' matter of complex proportions that needs addressing through cross-disciplinary competences. Buchanan referred to wicked problems as "a class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications of the whole system are thoroughly confusing" (Buchanan 1992, p.15). In summation, we offer the following characteristics of wicked design problems: they are open ended tasks that are hard to delimit (in scope and in time) and by extension are inherently complex - they are inclusive and generous in what they take into account. For instance, when it comes to stakeholders, designers practice within a complex landscape of end users made even more relevant by current debates on the troubles related to a strictly human-centric worldview. For designers to be able to suggest relevant design scenarios for robust futures they need to be able to make a site-specific attuned diagnosis and master various tools for visual communication (learning drawing formats, verbal communication, model-making skills etc.). Facing such wicked design problems that involve many uncertainties and unknowns leads to an elevated level of complexity during the design process. In this context, we specifically explored the potential and challenges of how peer learning dynamics could contribute to addressing these wicked design problems.

## 2.0 METHODOLOGY

The paper builds on empirical material on design processes that have been undertaken in group settings at the master's program of architecture and the bachelor's level of urban design at AAU during 2022 primarily and 2021, 2023. The subsequent paragraphs elaborate in turn on firstly the processes of designing through visual material gathered by the authors throughout the semesters (see section 2.1) followed by a section unfolding the role of being a peer through questionnaires and interviews with the involved students (see section 2.2).

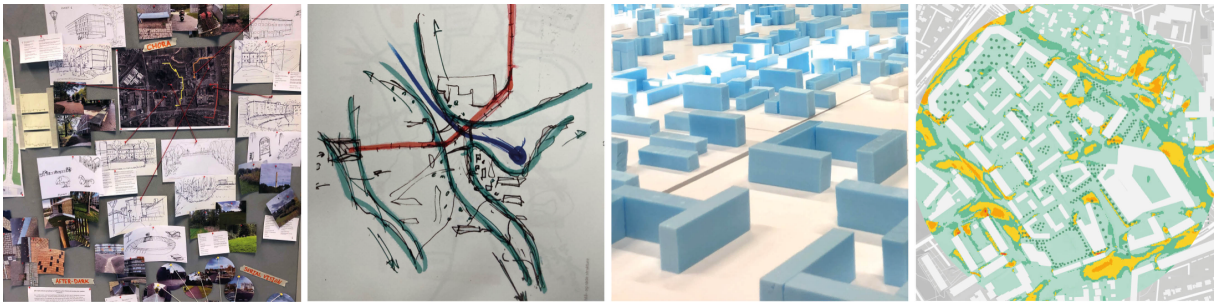
### 2.1 The role of visual material in peer learning

The following series of images give an insight into the visual material and underlying collaborative processes used throughout the semesters related to the analysis, design explorations, evaluations as well as visualizations communicating design proposals. The series of images invite the reader into the ongoing process of proposing, debating, and evaluating designs.

Figure 1 and 2 illustrates how the visual material comprises both hand drawn sketches and map annotations from analysis investigations as well as design ponderings on manifold made with various markers and pencils supplemented by three-dimensional foam and wooden models investigating the form of singular buildings and adjoining building structures. The final column of images shows examples of final digital visualizations through axonometric and bird view perspectives.



**Figure 1:** Glimpses into the collection of visual material used throughout the process of proposing design solutions on building scale. From left to right illustrating respectively elements from the analysis (maps with annotations), hand-drawn sketches, model exploration on building scale and graphic renderings of final designs. Source: own material (Berger and Olsen 2024)



**Figure 2:** Glimpses into the collection of visual material used throughout the process of proposing design solutions on neighborhood scale. From left to right illustrating respectively elements from the analysis (maps with annotations), hand-drawn sketches, model exploration on neighborhood scale and microclimate analysis visualization of final design solution. Source: own material (Berger and Olsen 2024)

At AAU the groups make up the near-peer environment (typically formed in groups of five to six students) where they work closely together and perform tasks of analysis and problem definition, design explorations and final design decisions. Group work is undertaken in a range of different situations; much of it within the close environment of their near-peer group supplemented by weekly visits from their allocated main supervisor (instructor), who follows them from project start until end. Figure 3 contains a series of snapshots from the collaborative processes of developing design proposals in groups of near-peers. They illustrate how the processes of sketching on manifold material and via models is central for the project development and show how design experiments are developed in a mix of individual design explorations and small teams (of either two or three students) testing ideas before rejoining their near-peer group to discuss.



**Figure 3:** Glimpses into the process of developing design proposals in groups of peers. From left to right illustrating the mixture of individual, dual, threefold, and near-peer design collaborations that unfold between design peers. Source: own material (Berger and Olsen 2024)

Learning situations that differ from the everyday collaborations within the near-peer group and instructor are workshops, pin-ups and status seminars or midterm critiques. A workshop and a pin-up are typically organized in an open space with a flexible setup of pin-up boards and stools with the participation of the entire cohort of students on the same semester (or a smaller sample of them) including also representatives from the instructors. All able to and encouraged to offer feedback on the presented material. The analogue material on the pin-up boards is often hand-drawn material and the work models are equally sketchy. Whereas a workshop is scheduled over several consecutive days which are allocated for the students to intensively study and evaluate a certain aspect of their design within their near-peer group, a pin-up gives space in an hour-based format for an open collaborative discussion on the work in progress. A status seminar represents a format of a mid-term presentation that usually takes place in a closed seminar room with tables and chairs placed in fixed rows, where the groups use digital presentations with detailed illustrations, that give the impression of (more) final design proposals. As with pin-ups, the instructors and co-peers from the same semester can provide feedback in the situation.

Figure 4 illustrates a series of activities transitioning from learning situations within the near-peer group (left picture) towards evaluative discussions in pin-ups and status seminars with the participation of larger cohorts of students. The pin-up situation clearly foregrounded work-in progress through analogue material and sketches. Whereas in the status seminars digital presentations represented nearly final design proposals. Lines of sight and lines of speech differed greatly across these two situations, which draws attention to the importance of considering what kind of interaction any learning environment may afford. As Gänshirt points to how the materiality and the things with which you learn and discuss is extremely important – they become also contributing factors in a peer learning situation (Dunn 2014; Gänshirt 2020).



**Figure 4:** Glimpses into the formats of collectively discussing, debating, and evaluating design proposals as peers. Left to right transitioning from situations within the near-peer group towards evaluative discussions in pin-ups and status seminars with the participation of larger cohorts of students. Source: own material (Berger and Olsen 2024)

## 2.2 The role of being a peer

The included images of designing and evaluating serve to illustrate the learning situations which the students have been part of throughout the semesters. The following section 3 invites the reader into the experiences of the involved students with the aim of reaching a better understanding of the students' experience throughout the process of designing together as a collective. The paragraph builds on a questionnaire carried out with the students of the 7<sup>th</sup> semester architecture students (47 responses, 96% response rate) and four qualitative interviews with 5<sup>th</sup> semester bachelor students. Questionnaires and interviews helped to both qualitatively and quantitatively assess the students' perception and progression at different stages of the design process.

The questionnaire included 19 questions that covered topics related to course content, knowledge transfer, and overall assessment. The questions were posed in both open-ended questions as well as using a 5-point Likert scale (strongly disagree, disagree, okay, agree, strongly agree). The questionnaire was handed out to the students at the end of a workshop and pin-up. Students needed approximately ten minutes to finalize the questionnaire. The qualitative interviews were semi-structured inquiring into the respondent's experience during selected activities during the semester; study circles, pin-ups, workshops, and status seminars where the students were allocated an active role as peers for their co-students. In these situations, they reviewed and critiqued each other's design proposals through oral feedback in the situation, complemented by written feedback for which they were provided with peer feedback guides that outlined the important themes for the feedback. The interviews lasted for approximately one hour and the open structure allowed for the respondents to freely elaborate on their experiences during the semester.

## 3.0 DISCUSSION

Four interviews as well as questionnaire results supplied insights into the experience of being a student making a project and following the described activities. Each student volunteered different perspectives; both in terms of potentials and problems related to peer learning. In the following subsections, the main findings that illustrate the experience of peer learning dynamics in design education in the context of the Aalborg model are summarized.

### 3.1 Motivation and practices of peers in collaborative settings

It was nice to be given an active role. And it was clear that you were supposed to say something. You felt obliged to be active. Others were counting on you (Excerpt from student interview, 2022).

It kind of validates that you have your own voice. That your professional competences are not completely off (Excerpt from student interview, 2022).

The conducted semester activities and follow-up interviews with the students generally confirm that students gain motivation from being assigned the role as an active peer. One of the factors pointed to is the binding character of the assigned role; especially in the situation of a status seminar where peer-opponent groups were asked to be the first ones to offer feedback. Inactivity would have apparent consequences in the situation with the peer group receiving no feedback displaying the poor engagement of the opponent group, but the included quotes testify to the also affirmative motivation which the students experienced in that situation, which confirms the points raised in existing literature on peer learning.

The included Figures 1-3 however contribute also important aspects related to how the layout of the physical environment and the material available (sketches and models) in different ways support the peer feedback situation through either circular discussion formations where the hierarchy between participants is flat with the design material in the middle, rather than linear set-ups with the instructor as the center of attention and main contender. This confirms how feedback does not take place in a vacuum (Hattie and Timperley 2007) but that the particular material available and the layout of the rooms factors in. Students elaborate also that the insights they gain through

performing peer feedback rehearse their ability to offer relevant critical reflections, inquire into and understand different viewpoints which is necessary in tackling open-ended design problems with a multitude of end-users. Also, self-organization as well as discussion and working in collaborative environments prepares them for future work-related situations.

Also, one student offers the following explanation:

You have an increased awareness towards the projects of others. You learn a lot seeing what others have done. And you take it back into your own project work (Excerpt student interview, 2022).

In confirmation the interviews contain passages with students offering insights into how peer feedback gives input that transfers and qualifies their own project work on the same semester and even beyond, as the positive experiences from collaborations on one semester inform future student practices in subsequent courses shaped around individual work where they independently continue to form smaller peer groups. This refers and confirms the notion that feedback supports students in an interactive and iterative design process (Carless et al. 2023).

### 3.2 From instructor to mediator

There was a lot of focus on ensuring that the opponent groups were given space and time to talk. It could have been nice if there were a maximum amount of time. It is a shame if the opponent group spends all the time, that's kind of a waste of time. The supervisors did not have enough time. After we had noticed that too much time was spent on the opponent peer group, we adjusted our own line of questions – and narrowed it down to only three. Because they are not there to receive supervision for our sake (Excerpt from student interview, 2022).

A further aspect refers to the instructor's role in the peer learning dynamics, which the literature also addresses. On the one hand, the interviews pointed out that even though peer learning is central in the semester organization, instructors play an important role in guiding students in the various situations making clear what are we providing feedback for and how, thus structuring and framing the discussion and feedback settings among the groups. Especially in earlier bachelor semesters, the provision of key discussion points or basic guidelines helped students to understand and fulfill their role as an active peer in ways assuring that their feedback focused on relevant topics. Some of this may be achieved beforehand through guides and verbal direction. However, the students also point to how instructors have a critical role in the room as they perform situated on-site filtering and translating so to concentrate on key discussion points to avoid misleading peer guidance.

The included quote also reveals the student's inclination towards prioritizing the feedback from the instructor rather than their peer students. Some students expressed also, that without instructors filling a mediating role in peer discussions, it could become a de-motivating factor for some because students feel as though the quality of peer comments varies among the student cohort. The images in Figure 4 reveal also a dominating orientation (both visual and bodily) towards the position of the instructor in the given situation. These issues confirm the critical points raised earlier related to maintaining a certain quality of the peer-feedback (Falchikov 2003; Turner 2021). The instructor mediating the dialogue among student groups thus become central to provide a collective, supportive, safe, respectful, and appreciative environment among all involved. Otherwise, the collective setting runs the risk of creating tensions or demotivation among students.

### 3.3 From peer learning situation towards culture

You measure and weigh your own project and others' based on a comparison with the rest of the semester's work (Excerpt from student interview, 2022).

It [referring to the position of being assigned as peers across groups] is kind of forced out of us. We see it [referring to their project work] as kind of our little project, and it becomes insurmountable to get into someone else's project and process. That has been really isolated (Excerpt from student interview, 2022).

When it comes to peer learning, the students' reactions and comments relate in general points to how the prevailing culture of learning is short-term oriented, focusing mainly on semester deadlines and hand-in requirements. Also, it is clear how students' past experiences from earlier semesters and perhaps even before entering the university influences and affect how they conduct themselves in peer situations and in their overall learning strategies. By extension, it is not necessarily constructive to set up peer learning situations with room for reflection and intuitive discussions if the students have not yet learned to ask open and inquiring questions. In addition, if they have not previously experienced that offering inquiring reflections are well received, and that presenting rough and unfinished design suggestions may lead to unexpected yet valuable perspectives, it is difficult indeed to remain open for feedback through dialogue.

We have become better at offering critique. And then you become better also at seeking out critique or feedback. There is a lot to gain by seeking out the other groups (Excerpt from student interview, 2022)

As the included quote also testifies, the students however also take note of how they have matured in their ability to invest in a shared learning community benefitting also their own long-term horizon of learning. The students independently offered insights into differently situations that they believed held peer learning potential. For instance, a final exhibition created at the end of the semester showcasing the project work with physical models and posters from all groups, to which also students from earlier semesters were invited, was pointed to as a valuable platform that enabled knowledge building related to different design methodologies and communication strategies. This foregrounds the potential of working also with peer learning across semesters in order to establish a culture around peers that transgress a short-term learning horizon (Pelsmakers et al. 2020).

## CONCLUSION

As Lawson emphasizes, designers gain an understanding of their subject "through the act of designing itself" (Lawson 2006). At CREATE the act of rehearsing design skills is conducted with and via groups of peers. In this context, the presented contribution discusses considerations and insights into peer learning dynamics within a PBL architectural education. The research question that was stated at the outset "*How can the didactical practice of*

peer learning in groups in architectural education contribute to address wicked design problems? Furthermore, what are the potentials and challenges of group work in the process of design?" led to several reflections.

On the one hand, there are several potentials towards peer learning practice: Students experienced increased motivation due to the allocated responsibility of being assigned the role as a peer. Another beneficial aspect refers to the possibility to practice working and discussing in a collaborative environment as well as enabling an interactive and iterative design process. Also, we could clearly observe that students' skills towards critical reflection, argumentation, and self-organization improved throughout the studied period. Also, their learning horizons shifted to include also long-term perspectives related to how investments of time and engagement into the collective learning culture benefitted the singular student beyond the given semester. On the other hand, we could also identify some challenges. These refer to an observed unbalanced engagement and active participation by students, potentially inherited from past experiences within a short-term oriented learning culture influenced by strict time and hand-in requirements. Another challenging aspect addressed the twofold mediating role of the instructor that needs to balance both key content points as well as interpersonal interaction among peer groups. Moreover, it has to be noted that it needs a certain effort to establish and mature a peer learning culture among both students and instructors, that takes also the physical attributions of the space, the material with which you learn, the provided guidance and thus the degree of alignment when it comes to inter-peer expectations into account. Overall, peer learning situations contribute to the students' learning trajectory. Consequently, coordinators and instructors have the possibility of enabling the maturation of a peer learning culture, where the learning and skills which mature within the individual students may not show themselves exactly within the situation and semesters you are in at the time, but rather matures over time and enables better design-making in advanced semesters.

The exemplary insights that have been alluded to above, show the didactic potential of peer learning in an architectural education within the framework of the pedagogical PBL teaching practice applied at CREATE. Such an approach could support sustainable, long-term, and deep learning in the field of architectural education that appears to be essential to develop skills towards being able to address wicked design problems.

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