



# Learning Strategies Among Students During a Sudden Transition to Online Teaching in a PBL University

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*'When everything is virtual, I feel I am weightless in the universe, just like an astronaut, connected to a space station, that floats round the Earth without any grounding.'* [28]

**Abstract.** Increasing use of digital tools in university teaching has drawn scholarly attention to the interaction between pedagogical design and digital technologies. The accelerated transition to online learning following the COVID-19 crisis has raised several questions regarding the links between technological affordances and learning strategies, especially with regard to the role of dialogue in learning. Based on a survey of 51 postgraduate students in a Danish university with Problem Based Learning as explicit teaching strategy, where collaborative interaction and dialogue are regarded as integral to learning, this study investigates how students navigated the altered learning environment. We found that students' experiences with online teaching demonstrate reduced affordances for learning. They experienced decreased co-involvement in decision-making, decreased collaboration and a changed pedagogical setup that did not support learning through discursive meaning negotiations. Thus, whilst dialogues can be transformed by digital technology, these changes are not necessarily productive within an environment which emphasises democratic discourse. Arguably, the digital transformation will continue to evolve and influence the quality of university teaching. Our paper concludes by discussing the potential of democratic dialogic teaching to stimulate learning ecologies in online and hybrid learning environments.

**Keywords:** Online learning · Dialogic pedagogy · Hybrid learning · Learning ecology · Collaboration · Problem-based learning

## 1 Introduction and Theoretical Underpinnings

In contemporary educational thought, collaborative learning as a means to ensure collective and individual intellectual gain continues to be considered beneficial, although it

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may not always lead to the intended outcomes [1, 2]. Collaborative learning is defined as two or more students working together towards a shared learning goal [1, p. 247]. This is distinct from cooperation in which students work separately with portions of the task that are later fused into a comprehensive product [3]. Common to collective and collaborative learning activities is that participants are assigned a problem and asked to work together to achieve a solution [1, p. 248]. Problem-based learning (PBL) is a pedagogical design in which students in groups engage actively in problem-solving and thereby extend their knowledge and co-create a solution to the given problem. In this collaborative activity, inquiry entails the critical analysis and synthesis of new information gained when confronting opposing discourses. This meta-reflection as a collaborative practice in which students develop dialogic argumentative thinking and writing competences reflects the core of dialogic pedagogy [4, 5], which values the heterogeneity of knowledge, of language and of reasoning [6]. An *epistemological* definition of dialogue is that it offers a theory of meaning. It implies that education should be designed to engage students in an ongoing process of shared inquiry that takes the form of a dialogue [7]. An *ontological* definition of dialogue is concerned with the very nature of our existence. Dialogue is not only a means to construct knowledge between selves, rather, selves and reality are part of the dialogue. These two different understandings of dialogic education focus on transforming the self, reality or social reality [8].

Dialogic pedagogy has primarily been described in relation to school contexts and with a focus on classroom teaching. Here, it is deemed as a participatory imperative [9, p. 1998] as it aims to develop and legitimise participation from all parties in classroom interactions [10]. Only a few studies have described dialogic pedagogy in online contexts. One of these is Simpson [11, p. 136], who argues that when social networks are added to the learning context, then it is the teacher's responsibility, 'through the explicit and focused use of critical reflective dialogic practices' in activities aligned with required outcomes, to provoke students to value the role of dialogue in their own learning. Thus, the teacher is active and responsible for enhancing learning. However, democratic pedagogical purposes can be challenging. Aiming to foster each student's agency and participation in the construction of shared classroom understandings means that all students should be positioned as capable collaborators. The idea that humans through education develop their capabilities of agentic and autonomous action and that education is key to empowerment and emancipation has been central since the Enlightenment [12, 13]. Whereas agency in past decades has been theorised rather one-sidedly in the structure-agency debate, as have the factors that promote or hinder agency [14–16], in this paper we focus on the ecological conditions which impact the achievement of agency. This action—theory approach is based on Dewey's so-called transactional constructivism [17, 18] meaning that the transaction between organism and environment can be read as an account of the construction processes that lie beneath all human activity. Within this understanding, agency is seen as the way in which actors 'critically shape their responses to problematic situations' [12, p. 11]. Thus, rather than understanding agency as something that resides in the individual, in this paper we see agency as something emerging from the interaction between humans (here students and teachers) and situations (here the educational context).

Biesta [19] focuses on what might be involved in education in a world of human difference. He argues that 'good' education requires answering the question of purpose which, according to him, relates to the three domains of qualification, socialization and subjectification. Qualification consists of knowledge, skills and dispositions. Socialisation is about the formal and informal ways in which we, through education, become part of certain social, cultural and political orders. In his description of the concept of subjectification, Biesta takes as his point of departure Kant's concept of formation, i.e. the way in which through upbringing and teaching the individual can become able to make use of their mind without the guidance of another and thus step out of their self-inflicted immaturity. It requires teachers to maintain a sense of their students as unique individuals in the process of developing their individual voices and relationships with the world. However, while research in classroom dialogue is well established [9, p. 1996], recent technological advances have led to a scholarly interest in the mediating role of digital technologies in enabling collective knowledge building in education [34]. Ordinary conceptions of dialogue can be extended to include digital technologies in a dialogic-interactive manner [20]. In the age of the Internet, the variety of learning trajectories has increased significantly, spanning physical and virtual domains and involving an increasingly personalised use of digital technologies.

An interesting concept in this connection is that of learning ecologies [21–23]. Learning ecologies are instances of eco-social systems that follow a developmental trajectory, i.e. they involve relational and interactional processes in the construction, sharing, and reconstruction of meaning. Seen from a learning ecology perspective, the Internet and digital technologies have altered our environment and hence the way we learn. Related to this is the concept of hybrid learning, which involves dialogue across a variety of learning and practice settings through different types of physical and digital networks and various technologies. Hybrid learning supports 'fluid forms of becoming and being in, with and for the world' [24, p. 78]. Digital technologies play a crucial role in connecting and mediating learning expeditions in hybrid environments as they afford various ways of engaging with technology, which serve individual as well as joint objectives, i.e. interaction with digitised content, problem-solving, dialogue and relationship building and discursive practices involving various forms of dialogue [25, 26].

Like any ecological system, a learning ecology can function in a balanced and sustainable way, but it can also destabilise due to uninformed action or disruptive events. The forced transition to online teaching due to the COVID-19 lockdown has caused such a disturbance. The sudden transition to online teaching has forced educators and students to skip the expected gradual transformation towards increased digitisation in university teaching, making all teaching activities 100% online overnight. In this paper, we are interested in how this transition has affected the dialogic element in teaching and learning, and what the role of dialogue would be in recovering the ecological learning balance in an online and possibly hybrid learning environment. We focus on students' experiences in order to get a sense of the individual and collective discourses that inform students' perceptions and judgements on what motivates and drives their action during the unexpected digital transition due to the COVID-19 crisis, particularly regarding the role of technology in supporting or inhibiting discursive spaces through dialogue. We find this context very fruitful for considering the agentic dimension of students' actions

as their responses reflect changing orientations due to new structural environments of action due to the COVID-19 pandemic.

In order to gain insight into the critical aspects, challenges and potentials of collaborative learning and dialogic pedagogy with the rapid transition to digital teaching, we ask:

*How is the accelerated digital reorganisation of teaching experienced by a group of students in a PBL university in terms of collaboration, dialogue, and experienced learning? What educational potential can be found in digital learning ecologies for enhancing the three domains of the purpose of education (qualification, socialisation and subjectification)?*

## 2 Methods

The present study is based on data from a master's degree programme in the field of humanities in a PBL university during the first three months of the COVID-19 lockdown. It aims to map students' learning experiences during the digital turnover. The digitised experience covered online course teaching such as synchronous and asynchronous lectures. Teachers were free to choose from among the platforms that the university had cleared under the General Data Protection Regulation (GDPR), which included Zoom, Teams and Skype for Business. Some teachers also chose to communicate only via Moodle, the Content Management System used by the university, where they uploaded PowerPoint presentations with voiceovers. The online supervision of student PBL projects was conducted in one of the aforementioned GDPR-compliant platforms, i.e. Zoom, Teams, or Skype for Business. Most students did collaborative group work, although some chose to work on their own. Teachers were free to design their teaching in any way they preferred, so the students were exposed to different forms of online teaching. This master's degree programme enrolls students from diverse backgrounds. Some have academic bachelor's degrees in humanities or social sciences fields and are relatively well-versed in working and writing academically. Others have professional bachelor's degrees, which often focus more on training for a particular profession and its related methodologies. A postgraduate degree is a challenging experience for many students, especially during the main PBL project each semester, in which they have to collaborate across various academic traditions. A survey was developed by the authors which addressed a variety of digitised course teaching activities that the students were exposed to during the lockdown, combined with prior experiences from the time of their bachelor's studies; the survey also related to the project work with regard to online supervision and online group collaboration. We hypothesise that students' perceptions of these issues reflect their level of agency as a configuration of influences from the past (experiences with teaching from before the lockdown), orientations towards the future (what enables learning), and their engagement in the present [3]. The online survey was answered by 51 out of 136 active students (i.e. 37.1%); responses represented the university's two campuses relatively equally.

We supplement the survey results with two student testimonies retrieved from student-conducted projects that also focused on the sudden exposure to online teaching [27, 28]. Both student projects were based on a combination of surveys and qualitative

interviews. One study was based on the same master's degree programme as the present study [27], but only at one campus. The other was aimed at the broader student body at the PBL university [28]. In addition, we draw on a written student reflection during the lockdown, submitted to one of the researchers, who was assigned as the student's learning supervisor [29].

The data has been analysed drawing on Biesta's three separate educational dimensions of *qualification*, *socialisation*, and *subjectification*. The questions in the quantitative part of the survey (see Tables 1 and 2) provide data that reflect the concept of *qualification*, addressing if and how online education provided students with subject knowledge (i.e., ultimately helped them become critical thinkers and thus qualified their participation in societal affairs). The qualitative part gathered students' open-ended responses to what supported learning, whereby *socialisation* – which is typically formulated in the overall curriculum – is reflected in students' responses to the values and behaviours that the university, according to them, is meant to foster. Finally, *subjectification* is investigated by focusing on statements that reflect the teachers' ability to sustain a sense of the students as unique individuals by helping them to develop their individual voices and relationships with the world. We are particularly interested in the possibilities for synergy between the three domains, but also where they are in conflict. This, we argue, will enable us to deal with 'trade-offs' between the three domains [14, p. 79].

### 3 Results

The quantitative part of the survey included questions regarding the degree of ease in transitioning to an online teaching environment as well as online PBL supervision, primarily relating to the domain of *qualification* (the ability to acquire new knowledge and skills in the new online learning environment). Responses were expressed on a Likert scale with five possible degrees, where (1) is 'Totally disagree' and (5) is 'Totally agree'. Table 1 presents a summary of the questions and the distribution of the answers within three categories, where (1) and (2) combine into 'Mostly disagree'; and (4) and (5) comprise 'Mostly agree'.

**Table 1.** Questions related to the digitised teaching and online PBL supervision

Question	Mostly disagree	Neutral	Mostly agree
<i>It was easy for me to get used to the online teaching</i>	33%	25%	42%
<i>It was easy for me to keep up with the communication about the organisation of teaching, including presentation of content, tasks and activities, etc</i>	40%	36%	24%
<i>It was easy for me to get acquainted with the various digital formats and software used to conduct teaching online</i>	31%	36%	33%
<i>It was easy for me to adapt the provision of online teaching to my own learning preferences</i>	42%	29%	29%

(continued)

**Table 1.** (continued)

Question	Mostly disagree	Neutral	Mostly agree
<i>I received help and answers to my inquiries from the teachers regarding the online teaching</i>	7%	29%	64%
<i>It was easy for me to get used to supervision going on online</i>	11%	4%	85%
<i>It was easy for me to select suitable technologies for online supervision</i>	7%	15%	78%

There is a relatively wide distribution of perceived degree of ease regarding various aspects of the online teaching. Elements relating to communication about the logistics of online teaching as well as to the ease of adapting digitised teaching options to individual learning preferences seem critical to many of the students, possibly reflecting uneven opportunities for learning. This group of students are accustomed to classroom teaching and it may be confusing to find one's place in a multimodal environment with different affordances for learning. Their responses reflect difficulties in navigating this environment and the need for teacher control. Notably, teachers are appreciated for offering clarification in response to students' uncertainties, which indicates that from the students' perspective, teachers play a strong role in guiding students to become part of this new social order. This might indicate that during the lockdown, most students expressed agency in asking their teachers for help. Remarkably, students seemed to adapt easily to an online PBL supervision environment and were able to select suitable technologies. This could partly reflect a prior *socialisation* to the more autonomous nature of PBL project work, and partly the more manageable coordination task regarding online interaction around a known subject, i.e. students' projects, with only one teacher/supervisor. However, in terms of collaboration, we see that students prefer getting feedback from the teacher rather than peers.

In the survey, we also asked students about which ways of digitising teaching they considered important to their learning. In responding to this question, they had the option to select from several pre-formulated options as well as add their own statements. The responses are summarised in Table 2, which lists the distribution of responses starting with the issue deemed most important. Overall, we see that students ask for explicit criteria for their work during online teaching, addressing the dimension of education that focuses on *qualification*. Here, we see that students deem it very important to get explicit norms from teachers as to what is considered the 'right' student behaviour. This raises the question of whether presenting students with predefined standards for the 'right' knowledge (cf. the *qualification* domain) and the 'right' behaviour (cf. the *socialisation* domain), followed up by narrowly structured and objective-oriented education, is conducive to learning. Alternatively, exposing students to less-structured contexts for knowledge creation, which allow a more fluid process of knowing similar to moral or political education, could elicit the students' active engagement and sense of learning as agentic action (cf. the *subjectification* domain). Qualifying students with planned

knowledge represents but a limited educational aim. From this perspective, it is alarming that only 24% of students expected to be part of decision-making processes, whereas 42% preferred real-time activities during the online teaching which requires standard sequences of activities unless the teacher is able to improvise in response to each class' unique flow (for further discussion on the artful balance of structure and improvisation, see Sawyer (30)).

**Table 2.** Overview of students' answers on the approaches to digitising teaching that are important to their learning

Following ways of digitising teaching are important to my learning	
<i>The expectations of students in online teaching are clearly communicated</i>	76%
<i>Adding audio to a PowerPoint presentation to display as needed</i>	64%
<i>I receive online feedback from the teacher on my assignments</i>	60%
<i>The online teaching is organised so that I develop my critical, analytical, creative or practical sense of working with the material</i>	53%
<i>I can structure my time as a student in an online teaching environment</i>	51%
<i>The teacher makes a plan for online teaching, which helps me structure my time</i>	47%
<i>Online teaching is organised so that I experience increased self-insight and can reflect on and assess my own experiences and knowledge</i>	44%
<i>I get activated to participate individually in real-time teaching</i>	44%
<i>I get activated to work in groups in real-time online teaching</i>	42%
<i>There is a uniform way of organising online teaching across the various modules</i>	42%
<i>The lectures are synchronous, using online meetings with direct presentation</i>	35%
<i>I participate in group assignments to solve in a set group before or after teaching</i>	31%
<i>I experience being seen and recognised in an online teaching environment</i>	29%
<i>The online teaching supports that we know &amp; contribute to each other's learning</i>	24%
<i>The online teaching is organised so that I feel part of the decision-making processes</i>	24%
<i>I receive online feedback from my fellow students</i>	22%

In the qualitative part of the questionnaire, we see a more mixed picture. Here, despite the new structural circumstances, in terms of the domain of *socialisation*, students express their expectations that teaching be based on principles of a high degree of student involvement. This is exemplified by the following statement made in response to being asked about what enhances learning:

'That we as students are involved as much as possible, despite the online format. For example, by organising and facilitating parts of the teaching itself so that you get co-responsibility, feel ownership and commitment in the digital space, where you can otherwise easily become invisible'.

This student is constructing a distinction between analogue and digital teaching and arguing that, in the case of the latter, when aiming for the achievement of digital

*qualifications*, there is a risk of a negative impact on the domain of *subjectification*. There is a perceived risk of becoming invisible as students – not only to the teacher/supervisor, but also to other students, and to themselves [33]. In digital teaching, teachers often ask students to join meetings without video and audio enabled unless asked to say something. Thus students can maintain a visible digital presence through their logged-in status but are physically and mentally non-present. Student involvement depends even more on the teacher to be aware and to let the students engage actively with the learning situation. The analogue learning environment is endowed with known modalities to escape feeling invisible – students can choose to involve themselves and teachers and the other students can enable and elicit involvement. The students mention how they used to learn from listening to other students' discussions, and by asking questions. This is made more difficult in the digital learning environment.

Another student emphasises how group work related to teaching sessions is considered of worth for his/her learning: 'It helps me to be part of a group, I have greatly benefited from my project group'. To this student, there seems to be synergy in the domain of *qualification* and *socialisation* when working in groups as not only qualification and academic achievements count for her. This is also a goal in the pedagogical design of PBL, and although group work was made digital too, belonging to a group as a place for qualification, socialisation and subjectification may still be important.

A qualitative investigation conducted by some of the participating students [27] demonstrated other viewpoints. Here, some students explained how they chose to work with peers and groups other than the groups generated by the teacher. They chose fellow students who they knew, who were visible, and who were considered as being more actively engaged in the teaching sessions and showed agency in learning. They also emphasised the importance of the teacher/supervisor's participation in online discussions.

However, according to many of the students, group work ought to be orchestrated in a certain way to be considered successful. This student explained how she expected the teacher to take the role of facilitator during their group work:

'It helped if you met in small groups, that is, if the groups were formed by the teacher. In those cases, it was instructive that the teacher went in and out of the small digital forums and participated in discussions'.

According to Biesta, teacher judgment is essential to education. With the teacher as a facilitator, key educational questions of content, purpose and relationships might be forgotten. Thus, to Biesta the language of learning is insufficient for expressing what education is about because it does not answer the questions of learning 'of what' and 'for what' [14, p. 76]. However, we do not know from the student's quote the way in which the particular teacher participated in the discussions. It might be that they actually acted in a way which promoted agency for both the teacher and the students.

Students' responses also describe experiences with using diverse platforms for group work and dialogues, reflecting how students use dialogue to scaffold their learning and the importance of the ability of the digital tools to create a shared dialogic space. This is reflected in the following quote, in which a student explains what increases her learning:

‘That it is possible to do reflection tasks and other tasks with fellow students, so that the material is processed in different ways than reading on your own and attending lectures. The timeframe in which the work is to take place should be fixed’.

Students appeared to struggle to maintain a stable identity when the only contact with peers was through digital technologies. Thus, they seemed to orient themselves toward a change to the existing order so that different ways of being became possible. An example of this attempt to be a subject of action is reflected in the following quote, where a student explains what is key to online teaching:

‘The most important thing is the contact with other people. So, there must be good opportunities to discuss and talk to one another; both teachers and fellow students, so that one does not sit alone with one’s thoughts’.

There are inescapable differences between the opportunities in a more conventional classroom and those online. It seems more difficult to reach a level of depth of reflection and critical thinking during online teaching. The statement below represents dominant issues in students’ perceptions of missing components of the experience, the lack of which inhibits their learning:

‘I have experienced missing the dialogues that typically occur in the classroom – between teacher and student – which to me greatly help to comprehend the material that is read in advance and which is elaborated during lectures by the teacher. It is as if a “layer” is missing – which we have not been able to access during this period’.

What we see here is an example of a missed opportunity to interact with more knowledgeable others as compared to the previous social order, i.e. live lectures. On the other hand, merely transposing familiar structures to a digital format is not an option as it inhibits the construction of meaning through direct dialogue. Rather, new and explicit active learning strategies are required in order to foster learning, which is explained by a student as follows:

‘The online format makes it necessary to create even more variety. Although traditional lecturing for a long period is also tiring in real-time teaching, it is even more tiring in virtual spaces. Therefore, the passive listening in front of the screen really impedes my learning. Things need to be staged and exercises implemented to a much higher degree when it is virtual’.

Several quotes reflect the student demand for more variety in order for digitised teaching to become more engaging. Although this aspect is considered central in ordinary class teaching, in online teaching it becomes even more crucial. The data, however, underscores that technological variation in itself does not ensure the quality of learning if the students have the feeling of being left to themselves, as the title of an abovementioned study puts it: Am I alone here – or are there others with me?’ [27]. More specifically, students ask for dialogue practices that are designed to spur curiosity in learning and promote critical reflective thinking.

In our survey, we also asked students about what enables and impedes learning when working together online in project groups. Generally, the students deplore the lack of face-to-face contact in project groups, which severs the exercise of individual agency due to difficulties of mutual relating. As one student explains:

‘The physical isolation. It is difficult to work in project groups without face-to-face contact. It’s not the same. Physical presence cannot be replaced by digital collaboration’.

Another student emphasises how true dialogue is missing during online interaction: ‘We missed the dialogue. It’s just not the same talking over an online media compared to talking face to face’.

In the pedagogical design of PBL, dialogue is a central component of collaborative learning, enabling the students to engage in common problem-solving. They challenge, provoke and argue as a means of knowledge negotiation in order to find new ways of understanding, which integrate their different academic and practical experiences. These types of dialogue are difficult for students to maintain online, especially when they do not know each other beforehand.

The statements below represent key issues of what enables learning, and interestingly, students relate to both domains of *qualification* and *socialisation* in their responses:

‘Virtual meetings with the opportunity to *see* other group members and supervisors are central’. Moreover, ‘strict appointments, committed group members, more frequent supervision enable learning’. Another student stated: ‘Written feedback prior to the online meeting. Well-prepared supervision’.

However, there are many factors related to the online digital environment which are experienced as restricting or challenging learning in project groups as students’ ability to interact is challenged:

‘I think it hampers my learning in the project that we are not sitting together. For me, it is especially about not sitting in the same room and having the interaction you would if sitting together physically’.

Students also face new technical challenges which arise as a result of digital learning. These relate to their having to sit in front of a screen for many hours, that the internet connection might fail, and, maybe the most important, that they have difficulties reading each other’s body language. Therefore, it became easy to misunderstand signals:

‘Technical challenges may occur, and meetings are less dynamic because it is more difficult to read each other’s cues and signals. More specifically, lack of body language. It is weird and not always optimal to sit and communicate on Skype’.

‘It may be harder to facilitate good discussions/workshops around topics – it is also harder to sit in front of a screen instead of meeting physically. It is harder to create relationships in a group when you only meet digitally’.

On the other hand, students seem to be able to see beyond the limiting factors of technology and refer to how online teaching and project work can improve their respect for each other and be more effective. Virtual collaboration related to project work seems to increase the necessity of better planning as well as mutual alignment of expectations and a certain discipline in presenting arguments and sticking to the point, especially as body language is no longer a possible way to argue:

‘It creates some flexibility, but it requires the group to understand that this is how we work. In our group, we established the expectation that we work when it fits in each other’s calendar’.

‘We are more efficient, and aware of respecting each other’s time. We have also become very good at handing out tasks, and then continually use the [online] platform to discuss things briefly. You are also forced to become clearer in how to articulate because you do not have gesticulation, a whiteboard or other artifacts to use in your explanation and communication with fellow students’.

However, many obstacles turn up within group work due to the total transition to online communication. As the group of students is very diverse, not all have strong competences in argumentation as an acquired skill helping them to move from pure disagreement to evidentiary discussion. As Alexander [31] argues, it is hardly surprising that some students view argument as conflict, and this becomes an even more sensitive problem to tackle in an online format. Students seem to employ evasive strategies to avoid professional disagreements that might escalate to personal conflicts, as the virtual environment is perceived to pose obvious limitations to conflict resolution. The challenge to reaching intellectually stimulating relationships in the virtual space was described in various ways:

‘That not everyone contributes equally, which creates an overload for oneself and means that one does not have anyone to discuss with anyway in the meetings. Therefore, you lose the sense of how much people read and prepare at home. In tactical terms, I also bend off if something could develop to a small conflict or discussion that would otherwise be exciting and instructive to unfold at physical meetings. Nevertheless, I have chosen this strategy to stick to what is possible when communicating through the computer, and to avoid misunderstandings. This is also about the lack of body language to help navigate, despite the camera’.

‘That you do not know your group members beforehand and cannot build relationships in the same way as if you could physically “hang out”. It is, therefore, ‘difficult to create relationships’.

‘It can be difficult to communicate over an online platform when you don’t know each other. Because you do not have the same group dynamics as when you sit together physically – you do not really get to know each other, and misunderstandings can easily arise.’

According to Biesta, teacher involvement and judgment are essential to education. We see in our survey that students are very explicit about what they find important to their learning regarding teachers/supervisors. They want clear information about the expectations of students and the responsibility for organising teaching so that they can develop a critical, analytical, creative or practical sense of working with their tasks. In addition, they ask for plans that help them structure their time, to be engaged fully in the learning process, and that their supervisor plays the role of facilitator during group work and gives well-prepared written feedback prior to the online meetings.

During the COVID-19 lockdown, many teachers spent much more time than usual on teaching and supervision in order to compensate for the loss of physical meetings and because they had to change their normal classes to an online format overnight. Transitioning to online teaching opens up important discussions concerning the position of the teacher/supervisor and the time spent on readjusting the learning design when traversing the analogue and online teaching spaces. Rather than covering both modes of teaching, teacher judgement might well be applied to combining the two modes into a hybrid learning space wherein they become gradually more integrated.

Biesta, building on the work of Dewey, states that processes of subjectification require that the teacher aims to support all students to become intellectually independent and responsible ‘subjects of action’ [32, p. 64]. The above testimonies may be interpreted

as troubling episodes with misunderstandings that can be transformed into learning opportunities for all.

## 4 Discussion

In their review of the factors that influence learning outcomes, student satisfaction and collaborative engagement in e-learning and blended learning, Nortvig et al. [33] found that the most prominent influences were the teacher's presence in online settings; interactions between students, teachers and content; and designed connections between online and offline activities as well as between campus-related and practice-related activities. In this paper, we found that students expressed a desire to be exposed to education that was safe and predictable. This is not surprising, taking into consideration the context of the educational changes. Regarding the potential for collaborative activities, dialogic exchanges and discursive meaning creation, the students experienced severe limitations in the online context as compared to the previous socio-pedagogic framework. They deplored the lack of face-to-face interaction, yet did not seem to exert their agentic capacity for co-constructing meaning in an online environment, presumably due to experiencing increased complexity. However, this leaves us with the question of how to plan digitally supported online teaching while at the same time maintain an orientation towards the independent thought and autonomy of the ones being educated. According to Biesta, teachers should also enact agency, that is, the freedom to act independently of the determining constraints of social structure [14]. If we accept the premise that education always impacts on the three domains of qualification, socialisation and subjectification, then, following Biesta [19, p. 77], 'as educators we must take responsibility for what it is we seek to achieve in each of these domains'. During the COVID-19 crisis, teachers were not able to fully exercise their judgment about the appropriateness of how they teach and organise their educational efforts. Rather, this was dictated by the government.

What, then, are the implications for students' agency? Biesta asks 'Is it indeed a good idea to treat students as customers and give them what they want? Does this give them a much needed 'voice' in the educational process and does it therefore enhance the overall quality of the educational endeavour?' [14 p. 82]. It is crucial to understand that students and teachers have very different voices because of their different responsibilities and expectations. So, how do we construct a dialogical pedagogy in a way that includes different voices?

Regarding the application of ecological learning principles in higher education, Richardson [23] has pointed at three main priorities. First, an ecology of learning should offer rich possibilities to locate and access learning items that students can organise and interact with to satisfy learning needs. Second, a learning ecology must support social learning through collaborative learning activities, wherein students engage in group discussions to explore content and 'discuss and share insights within their specialised communities of practice' [23, p. 48]. Third, a learning ecology requires an intentional design to create 'a learning system that adapts to varying student needs' [23, p. 48]. The perspective of learning ecologies suggests the need to offer rich and diverse possibilities for students to access learning in accordance with their needs and preferences in order to attain *qualification*. Equally important is *socialisation*, for which collaboration and

discursive meaning creation through dialogue are paramount. Finally, learning ecologies require intentional designs for learning that take advantage of the rich media ecology and the hybridity of learning spaces to inform student action and promote mutual engagement. A learning ecology can thus accommodate the *subjectification* function, spurring students towards the autonomy of thought and action. The dialogic element seems to be crucial in order to facilitate interaction and successful communication as well as invite students to value a diversity of perspectives and various ways of knowing. A learning ecology design should include explicit opportunities to engage in critical reflective dialogic practices in alignment with the learning aims.

In a PBL environment, dialogic practices can take on a variety of forms, depending on the learning activity, whether related to teaching, and thus to declarative and procedural knowledge, or to independent project work, which capitalises on the construction of conditional and functional knowledge. Similarly, dialogic activities ought to circulate reflective and meaning-creation processes across various learning environments.

Such activities could involve students or groups of students and the teacher/project supervisor, but also draw on input from external collaborators from the various organisational contexts where student projects are hosted as well as relevant formal and informal student and teacher networks. A digitally enhanced media ecology accommodates multimodal practices and thus rich possibilities to frame knowledge exchanges, e.g. written, pictorial, audio and video-based. More significantly, it also expands and enhances new discursive practices in hybrid, cross-learning and action spaces, connecting people and meaning in various situations, both synchronously and asynchronously. Dialogue needs to be specifically framed to suit such an expanded hybrid learning environment, which transcends familiar classroom practices. This can be a challenge not only for students, which explains the restrictive use of online engagement, but also for teachers, who need to redirect their pedagogic thinking from content-centric to a dialogical and discursive orientation of knowledge and practice.

Whether experiences with the sudden transition to online teaching due to the COVID-19 crisis can provide a reliable point of departure for designing for learning in a hybrid learning environment is a point for further discussion. In fact, as argued elsewhere [16], in this paper we, too, have found that students' responses reflect the temporariness of contexts of action and thus that their agentic orientations are subject to substantial variation. Their responses, therefore, display how they move between different and unfolding contexts that make them orient or 'recompose' the situation in various ways. The new emerging online learning environment is sustained by, and at the same time potentially altered through, students' agency as a response to teaching strategies. Similarly, teachers' actions are subject to students' learning affordances in the new environment. Dialogue and eliciting student co-involvement at a meta level, regarding the potentiality of digitally extended learning ecologies, may prove central to designing for learning in new hybrid spaces.

This study is exemplary, since many other higher education institutions may have had similar experiences with transitioning to online teaching during the COVID-19 lockdown. Therefore, we believe that knowledge generated through this study regarding the role of dialogic practices – not only to enhance learning and promote critical reflective thinking but also in co-designing learning in online hybrid spaces – can inform others

in the field. We may not base our future strategies for digitisation in higher education on the experiences from this sudden online transition, but we may use these experiences to initiate an exploration of dialogic practices to design for digitally enhanced learning ecologies. It would be of great interest to compare our results with those seen at other higher education institutions. However, at the time of writing, the basis for such a comparison does not yet exist as many of the studies from the period of the lockdown are not yet available.

## 5 Conclusion

In this paper, we focused on how a group of students at a PBL university have navigated the altered learning environment during the COVID-19 pandemic in terms of collaboration, dialogue, and experienced learning. We drew on an ecological conception of agency-as-achievement. We found that students' agency is achieved when they are able to ask for help from their teachers. In terms of collaboration, we also saw that students prefer getting feedback from teachers rather than peers. Students ask for explicit criteria for their work during online teaching, emphasising the dimension of education that focuses on qualification. Here, we see that students deem it very important to get explicit norms from the teachers as to what is considered the 'right' student behaviour.

Furthermore, we investigated what educational potential can be found regarding the three domains of the purpose of education identified by Biesta (qualification, socialisation and subjectification) in digitally enhanced learning ecologies. While students prefer teacher control in terms of predefined 'right' knowledge and social behaviour, informed judgement might encourage teachers to expose students to more open forms of knowing, and thus the challenge of withholding uncertainty. Students' qualitative responses cover a more mixed picture: Despite the new structural circumstances, in terms of the domain of *socialisation*, students expressed their expectation that the teaching is based on principles of a high degree of student involvement. When aiming for the achievement of *qualification* in a digitised online environment, there is a risk of a negative impact on the domain of *subjectification* as the students might become invisible. To some students, there seems to be synergy in the domain of *qualification* and *socialisation* when working in project groups, where not only qualification and academic achievements count.

Students' agency is hindered in a setting where their only contact with peers is through digital technology. In and through the particular ecological condition and circumstance of complete digitisation, it seems more difficult to reach deep reflections and critical thinking. Students' agency is also hindered if levels of variation in the digitised teaching, involving and activating are low. During online project work, the students miss face-to-face contact, which severs the exercise of individual agency in collaborative processes due to difficulties of mutual relating. The students mentioned physical isolation, loss of dialogue, loss of interaction and employing strategies to avoid professional disagreement because it can be difficult to separate these from personal conflict.

The ideal of PBL and group work is that students should be challenged to wrestle meaningfully with uncertainties that bear conflicting perspectives. Although democratic habits of mind might be achieved in practices where students learn to recognise and respect opposing arguments and differences of perspectives as a path to argumentative competence, in a COVID-19 crisis, this may be a learning goal too high to aim for.

It is important to take into account that the results obtained are shaped both by the feelings generated by the forced transition to the teaching modality and by the inexperience of teachers and students in developing activities in online contexts. This inexperience will also have certainly influenced the students' perceptions and even their performance in learning activities. The conclusions of this study must, therefore, be weighed according to the circumstances.

## References

1. Jeong, H., Hmelo-Silver, C.E.: Seven affordances of computer-supported collaborative learning: how to support collaborative learning? how can technologies help? *Educ. Psychol.* **51**(2), 247–265 (2016)
2. Kuhn, D.: Thinking together and alone. *Educ. Res.* **44**(1), 46–53 (2015). <https://doi.org/10.3102/0013189X15569530>
3. Dillenbourg, P.: *Collaborative Learning: Cognitive and Computational Approaches*. Elsevier Science Inc, New York (1999)
4. Alexander, R.: *Towards dialogic teaching: Rethinking classroom talk*. (4th ed.). Thirsk, Dialogos (2008)
5. Mercer, N., Littleton, K.: *Dialogue and the Development of Children's Thinking: a Sociocultural Approach*. Routledge. (2007)
6. Mayer, S.J., O'Connor, C., Lefstein, A.: Distinctively democratic discourse in classrooms. In: Mercer, N., Wegerif, R., Major, L. (eds.). *The Routledge International Handbook of Research on Dialogic Education*. London: Routledge (2019)
7. Linell, P.: *Rethinking Language, Mind, and World Dialogically*. IAP, Charlotte (2009)
8. Mercer, N., Wegerif, R., Major, L.: *The Routledge International Handbook of Research on Dialogic Education*. London: Routledge (2019)
9. Major, L., Warwick, P., Rasmussen, I., Ludvigsen, S., Cook, V.: Classroom dialogue and digital technologies: a scoping review. *Educ. Inf. Technol.* **23**(5), 1995–2028 (2018). <https://doi.org/10.1007/s10639-018-9701-y>
10. Mercer, N.: The social brain, language, and goal-directed collective thinking: a social conception of cognition and its implications for understanding how we think, teach, and learn. *Educ. Psychol.* **48**(3), 148–168 (2013)
11. Simpson, A.: Designing pedagogic strategies for dialogic learning in higher education. *Technol. Pedagog. Educ.* **25**(2), 135–151 (2016)
12. Biesta, G., Tedder, M.: *How is agency possible? Towards an ecological understanding of agency-as-achievement Working Paper 5*. Exeter: The Learning Lives Project (2006)
13. Freire, P.: *Pedagogy of the Oppressed*. Penguin, London (1970)
14. Biesta, G.: What is education for? On good education, teacher judgement, and educational professionalism. *Eur. J. Educ.* **50**(1), 75–87 (2015)
15. Mezirow, J.: *Transformative Dimensions of Adult Learning*. Jossey-Bass, San Francisco (1991)
16. Emirbayer, M., Mische, A.: What is agency? *Am. J. Sociol.* **103**(4), 962–1023 (1998)
17. Vanderstraeten, R.: Dewey's transactional constructivism. *J. Philos. Educ.* **36**(2), 233–246 (2002)
18. Dewey, J.: *Democracy and Education*. Free Press, New York (1944/1916)
19. Biesta, G.J.: *Good Education in an Age of Measurement: Ethics, Politics, Democracy*. Routledge, London (2015)
20. Twiner, A., Coffin, C., Littleton, K., Whitelock, D.: Multimodality, orchestration and participation in the context of classroom use of the interactive whiteboard: a discussion. *Technol. Pedagog. Educ.* **19**(2), 211 (2010)

21. Jackson, N.: Exploring learning ecologies. Lulu. com. (2012)
22. Barnett, R.: The Ecological University: A Feasible Utopia. Routledge. (2017)
23. Richardson, A.: An ecology of learning and the role of e-learning in the learning environment. *Global Summit Online Knowl. Netw.* 47–51 (2002)
24. Hilli, C., Nørgård, R.T., Aaen, J.H.: Designing hybrid learning spaces in higher education. *Dansk Universitetspædagogisk Tidsskrift* **15**(27), 66–82 (2019)
25. Stommel, J.: Hybridity part 2, what is hybrid pedagogy? *Hybrid Pedagogy* (2012). <https://hybridpedagogy.org/hybridity-pt-2-what-is-hybrid-pedagogy>. Accessed 15 July 2020
26. Aaen, J.H., Nørgård, R.T.: Participatory academic communities: a transdisciplinary perspective on participation in education beyond the institution. *Conjunc. Transdisciplinary J. Cult. Participation* **2**(2), 1 (2015)
27. Nielsen, M., et al.: Er jeg alene her, eller er der andre med? Digital undervisning på Aalborg Universitet, København under COVID-19 (Am I alone here, or are there others with me? Digital teaching at Aalborg University during COVID-19). Unpublished project report, Learning and Change Processes, Aalborg University (2020)
28. Brohammer Hansen, S.L., Blachman, S.: En evalueringsundersøgelse over digitale erfaringer gennem undervisningen af valgfagene på 8. semester (An evaluation study of digital experiences of the teaching in elective modules of 8th semester). Unpublished project report, Learning and Change Processes, Aalborg University (2020)
29. Submitted written student learning reflection to her supervisor during COVID-19 (2020)
30. Sawyer, R.K.: What makes good teachers great? The artful balance of structure and improvisation. Structure and improvisation in creative teaching, In: Sawyer, R.K. (ed.). *Structure and improvisation in creative teaching*. Cambridge University Press, pp. 1–24 (2011)
31. Alexander, R.: Whose discourse? Dialogic Pedagogy for a post-truth world. *Dialogic Pedagogy Int. Online J.* **7** (2019)
32. Biesta, G.J.: *Beautiful Risk of Education*. Paradigm Publishers, Boulder (2013)
33. Nortvig, A.M., Petersen, A.K., Balle, S.H.: A literature review of the factors influencing e-learning and blended learning in relation to learning outcome, student satisfaction and engagement. *Electron. J. e-Learn.* **16**(1), 46–55 (2018)
34. Major, L., Warwick, P.: ‘Affordances for dialogue’: the role of digital technology in supporting productive classroom talk. In: *The Routledge International Handbook of Research on Dialogic Education*. Routledge, London (2019)