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## Teaching strategies to facilitate social and cognitive processes in online learning environments

Chevy van Dorresteijn , Monique Meij, Natalie Pareja Roblin , Frank Cornelissen , Joke Voogt  and Monique Volman 

Research Institute Child Development and Education, University of Amsterdam, Amsterdam, The Netherlands

### ABSTRACT

This study used the Community of Inquiry framework to examine how university instructors designed, facilitated, and supported social and cognitive processes in online courses, and how instructors and students experienced these processes. In early 2021, 25 online focus groups were organized with instructors ( $n = 52$ ) and students ( $n = 44$ ) from all faculties of a large Dutch university to discuss this. In terms of design, instructors restructured their courses (e.g. reduced group sizes to intensify interaction and implemented a flipped classroom approach) and communicated more explicitly about the course structure and expectations to better enable students to self-regulate their learning process. During the course, instructors orchestrated cognitive and social processes by facilitating discourse (e.g. breakout room activities and collaboration activities) and offering direct support (e.g. online progress monitoring and “being there” for students). The analysis illustrated how teaching presence plays a crucial role in fostering cognitive and social processes in online courses. This study contributes to a better understanding of the role of teaching presence in a community of inquiry, while providing insights that can inform the development of effective online teaching strategies.

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## Introduction

Online education has been placed high on the agenda of many higher educational institutions over the last few decades (Dumford & Miller, 2018). However, as was experienced during the COVID-19 pandemic, transitioning to online education does not come without challenges for instructors and students. Instructors have to (re) design courses in accordance with online course design principles, requiring them to, among other things, consider how to facilitate online interaction and how to adequately fulfil their teaching role(s) in online settings (Gikandi et al., 2011). For students, online education requires them to self-regulate their learning process and study more

**CONTACT** Chevy van Dorresteijn  [c.m.vandorresteijn@uva.nl](mailto:c.m.vandorresteijn@uva.nl)

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autonomously (Delen & Liew, 2016). To date, most research on online higher education has focused on students' perspectives, with less attention devoted to instructors' perspectives (Martin et al., 2020; Theelen & Van Breukelen, 2022; Van Dorresteijn et al., 2024).

Importantly, many studies on online higher education lack a clear theoretical foundation (Theelen & Van Breukelen, 2022). One framework often used to analyse online learning environments is the Community of Inquiry (Col) framework (Garrison et al., 1999). While the Col framework has proven advantageous for facilitating meaningful online learning experiences (e.g. Caskurlu et al. 2021; Fiock, 2020), whether all online higher education contexts benefit from alignment with the Col framework has been contested (Maddrell et al., 2017). More research is needed regarding the usefulness of the framework across disciplinary domains (Caskurlu et al., 2020; Castellanos-Reyes, 2020) and how student populations experience online teaching practices differently (Caskurlu et al., 2020; Fiock, 2020). This study set out to provide a broad overview of online teaching strategies that are used across multiple domains. More specifically, we examined how instructors and students experienced the type of online teaching strategies that were used to orchestrate meaningful social and cognitive processes.

## Theoretical framework

The Col framework posits that online educational experiences are best supported in what are known as *communities of inquiry* in which instructors and students collaboratively construct meaning through sustained interactions (Garrison et al., 1999; Kozan & Caskurlu, 2018). It has been extensively used to understand the dynamics of online higher education settings (Garrison & Arbaugh, 2007; Garrison et al., 2010) and centres around three elements: teaching presence, social presence, and cognitive presence. This study primarily focuses on teaching presence.

### Teaching presence

*Teaching presence* refers to the design, facilitation, and direction of cognitive and social processes in order to realize meaningful learning outcomes (Anderson et al., 2001). There is growing evidence that teaching presence positively correlates with students' online learning experiences (e.g. Caskurlu et al., 2021; Martin et al., 2022). The first dimension of teaching presence is *course design and organization*, and pertains mostly to what instructors do *before* teaching. It concerns selecting, organizing, and presenting course content, as well as developing learning activities and assessments (Garrison et al., 1999). For example, in online environments instructors must clearly communicate their expectations and the course design in advance, because social cues and norms of the traditional classroom do not always apply and there are reduced opportunities for "on the fly" adjustments (Anderson et al., 2001; Van Dorresteijn et al., 2024).

The second dimension of teaching presence is *facilitating discourse* through managing and monitoring online interaction and collaboration. This dimension not only involves careful planning beforehand, it also manifests *during* online courses through instructors' actions, and includes activities such as encouraging student contributions and establishing a positive learning climate (Anderson et al., 2001; Shea et al., 2006). Because

interaction in online education differs from interaction in face-to-face education, instructors need to carefully consider how to elicit meaningful interactions with and among students through online activities (Anderson et al., 2001; Lowenthal & Dunlap, 2018).

Finally, the third dimension pertains to providing *direct support* to students. This dimension underscores an instructor's responsibility to actively support student learning by, among other things, identifying students' needs, facilitating access to various learning resources, and providing timely feedback (Garrison & Arbaugh, 2007; Garrison et al., 1999). Direct support is important for all types of education, but in online settings instructors also have to consider how to provide support remotely.

### ***Social and cognitive presence***

*Social presence* describes how people socially interact in the online courses (Lowenthal & Dunlap, 2018), and denotes the degree to which students personally connect with others in the online learning community (Sung & Mayer, 2012). Despite limited access to non-verbal cues (body language, facial expressions, etc.) in online settings, one can virtually express emotions, for example, through humour and self-disclosure (Rourke et al., 2001). Mutual awareness and acknowledgement of each other's contributions through compliments, follow-up questions, or expressions of agreement are important to give the feeling that someone is "listening to you" (Sung & Mayer, 2012). Various review studies and meta-analyses have found positive associations between social presence and online learning experiences (e.g. Martin et al., 2022; Richardson et al., 2017).

*Cognitive presence* refers to the extent to which students are able to construct and confirm meaning through sustained communication (Garrison & Arbaugh, 2007; Garrison et al., 1999). Students' active engagement, metacognition and self-direction play important roles in facilitating cognitive presence (Akyol & Garrison, 2011; Kozan & Caskurlu, 2018; Shea & Bidjerano, 2010; Shea et al., 2014). Shea and Bidjerano (2010) contended that students must exhibit specific behaviours, motivations, and strategies to effectively regulate their learning process (see also Shea et al., 2022). Instructors thus need to foster students' self-regulation skills to enable them to learn effectively in online settings (Maranna et al., 2022). In their meta-analysis, Martin et al. (2022) found that cognitive presence positively correlates with student outcomes.

### ***Teaching presence in relation to social and cognitive presence***

Numerous studies have illustrated how teaching presence plays a key role in establishing a community of inquiry (e.g. Caskurlu et al., 2020; Cleveland-Innes et al., 2019; Maranna et al., 2022; Moore & Miller, 2022). Learning environments are created through teaching presence; teaching presence thereby defines the boundaries within which students have to navigate (Moore & Miller, 2022). Social and cognitive presence are thus created and sustained through teaching presence (Heilporn & Lakhal, 2020). While empirical studies have established that teaching presence positively predicts both cognitive and social presence (Caskurlu et al., 2020), this has mainly been researched based on student perceptions (Shea et al., 2022). More research (e.g. based on teacher perceptions) is needed to better understand the internal dynamics between the presences, which

could be used to improve online learning and teaching practices (Heilporn & Lakhali, 2020).

### **The present study**

This study contributes to the CoI literature through its unique design. First, focus groups are rarely found in CoI research; to our knowledge, this study is unique in terms of the sample size (around 100 instructors and students) and diversity (participants were recruited across all domains and both graduates and undergraduates participated). This study thereby complements previous studies that were conducted in specific domains (e.g. West et al., 2023) or looked at undergraduates only (e.g. Lim & Richardson, 2022). Second, we looked at the online teaching strategies that were deployed and how those were experienced by instructors and students. Their experiences indicate which strategies may have actually worked and why. Explicitly juxtaposing instructors' and students' experiences contributes to a better understanding of whether students actually recognize instructors' intended aims, as well as whether instructors notice it when students do not pick up on their aims. Previous research suggested that what instructors consider successful teaching strategies may not match students' experiences (Caskurlu et al., 2020). The following research questions guided the study: *Which online teaching strategies (cf. teaching presence) did instructors use to design and promote cognitive and social processes? How were these strategies experienced by instructors and students?*

It is worth noting that the more loosely defined term *processes* was used, which was chosen to emphasize the reciprocal relation between instructors and students when it concerns social and cognitive processes. Social *presence* and cognitive *presence* mostly refer to the social or cognitive presence of students, with less emphasis on the instructor's role.

### **Method**

Focus groups allowed participants to collectively discuss their experiences with and views on online education through group interaction, thereby providing rich insights into participants' perspectives (Bourne & Winstone, 2021). Twenty-five online focus groups (12 with instructors and 13 with students) were organized across all faculties – in other countries these are sometimes referred to as *colleges* — of a large Dutch university. Focus groups were held with instructors and students separately to acquire “pure” teacher and student perspectives, as well as for logistic reasons. To avoid “groupthink” – where participants conform to group opinions rather than voicing their own (Chioncel et al., 2003; MacDougall & Baum, 1997) – several interviewing techniques were applied, such as encouraging participants to openly share their experiences and explicitly prompting discussions among participants with conflicting opinions. The university's ethics review board approved the study (no. 2020-CDE-12785).

### **Procedure**

Instructors were recruited through an earlier questionnaire on instructors' experiences with online education, newsletters, and key contacts (e.g. the Teaching and Learning

**Table 1.** Distribution of participants. *Number of participants (number of focus groups).*

Faculty <sup>1</sup>	Teachers	Students	
		Bachelor	Master
Amsterdam University College	3 (1)	3 (1)	-
Faculty of Social and Behavioral Sciences	9 (2)	7 (2)	3 (1)
Faculty of Science	10 (2)	4 (1)	3 (1)
Faculty of Law	5 (1)	4 (1)	3 (1)
Faculty of Humanities	8 (2)	3 (1)	4 (1)
Faculty of Economics and Business	9 (2)	4 (1)	3 (1)
Faculty of Dentistry	3 (1)	-	-
Faculty of Medicine	5 (1)	3 (1)	-
Total	52 (12)	28 (8)	16 (5)

<sup>1</sup>In some countries, these are referred to as *colleges* rather than *faculties*.

Centre). All potential participants were asked to complete a brief online questionnaire to ensure maximum variation in terms of instructor roles (e.g. educational directors, course coordinators, members of the exam committee), educational level (teaching bachelor's or master's courses), and course group size (small versus large). Students were recruited via newsletters, social media, and key contacts (e.g. study advisors) and separate focus groups were held with bachelor's and master's students. Within these student focus groups, maximum variation was sought in terms of year of study. Although most instructors and students had very limited experience with online teaching and learning prior to the pandemic, we assumed that the participants were able to differentiate between advantageous and inferior online teaching practices after well over a year of experience at the time of data collection.

Each focus group consisted of up to five instructors or five students from the same faculty (see Table 1 for the distribution); participating instructors did not necessarily teach any participating students. The focus groups took place in March-April 2021, lasted around 90 minutes, and were held and recorded through videoconferencing software. Twelve focus groups were held in Dutch and 13 in English, based on the participants' preferences. Both students and instructors were compensated for participating with a small gift.

To ensure an organic conversation, participants were asked to keep their camera and microphone on during the entire online session, and the moderator explicitly and continually encouraged participants to respond to each other. Two researchers were present in all focus groups. One researcher led the focus group and the other assisted by keeping track of the time and asking follow-up questions. Researchers were assigned to (co-)lead focus groups based on availability, while ensuring that all researchers moderated and assisted an equal number of times, as well as with a proportional division per faculty and between teacher and student focus groups.

### ***Focus group protocols***

Semi-structured focus group protocols were developed based on the Col framework (see Data availability statement to access the protocols). An icebreaker activity (~15 mins) was used as a conversation starter and to quickly establish participants' overall experience with online education. The second part (~60 mins) was structured around the dimensions of teaching presence. Participants were asked to write down their

experiences regarding social or cognitive processes, and then to reflect on them. A virtual whiteboard was used for these assignments. For the focus groups with instructors, the questions pertained to course design, facilitating online interaction, and supporting online learning. For the focus groups with students, the questions pertained to how they experienced online interaction, as well as how the courses contributed to (or limited) their ability to learn in an online setting. In the final part (~15 mins), participants were asked to express their views on the future (aspects) of online education.

Experts on online education were consulted to check the face validity of the focus group protocols and the protocol was tested in two pilot focus groups. The second pilot was included in the final analysis, as the protocol did not notably change after the second pilot and the data were deemed rich and insightful.

### ***Data analysis***

Verbatim transcripts of the focus groups were analysed. A first coding scheme was developed based on the three dimensions of teaching presence (Garrison et al., 1999). This initial coding scheme was iteratively revised and adjusted through negotiated coding (Garrison et al., 2006), where the first three authors double-coded 11 transcripts and discussed all discrepancies until consensus was reached. This process led to splitting or merging some of the codes, and to a more detailed description of what each code encompasses (see Data availability statement to access the final coding scheme). For example, early versions of the coding scheme included explicit distinctions between cognitive and social processes, but during the analysis few online strategies turned out to exclusively promote social or cognitive processes. Consequently, the coding scheme was revised to target the content of a strategy (e.g. online Q&A's) rather than its intended outcome (e.g. increased cognitive presence).

After finalizing the coding scheme, the first three authors recoded all transcripts and all equivocal quotes were discussed among them. Through thematic analysis (Braun & Clarke, 2006), recurring themes across the focus groups were identified that pertained to the course design (e.g. course structure), instructor actions (e.g. providing feedback), and instructor-facilitated student actions (e.g. self-monitoring strategies). Next, each of the first three authors wrote a narrative on one of the three dimensions of teaching presence. The instructor and student focus groups were initially analysed separately and then merged into one narrative portraying the perspectives and experiences of both instructors and students. The first author merged all narratives into a single coherent narrative (i.e. the Results section). Pseudonyms are used, and Dutch quotes were translated to English.

## **Results**

### ***Dimension one: course design and organization***

#### ***Reconsidering the course structure***

Instructors soon realized that online teaching required more than simply copying what they did in a face-to-face context:

I really had to think about the learning goals of the course I was teaching, because a lot of it is actually based on the work they normally did in the lab (. . .) So for me the learning goals were actually the starting point: What are my learning goals and which ones are still reachable? If not reachable in an online class, can I think of new assignments for them to be working on? To still reach those learning goals. (Ryan, Faculty of Science instructor)

In an online setting, instructors had to rethink how to enhance cognitive and social processes through online activities, particularly since instructors could not fully rely on the strategies and (non-verbal) cues they normally used to make “on the fly” adjustments. The course design thus had to be more detailed and explicit, although instructors also indicated that rigid planning may hinder the spontaneity of the lectures and compromises the occurrence of organic interaction.

To increase the quality of the online sessions, some instructors cut down the length of the sessions and taught the same lecture multiple times to smaller groups of students, intending such an approach to result in more intensive and more focused interaction. This approach yielded mixed instructor experiences. Some instructors were positive about the increased opportunities for interaction; others felt that it was counterproductive insofar as they fell behind in their planning because not all material could be covered, and it significantly increased their work load. A more favoured approach was cutting down the course material instead of the contact hours. According to instructors who did so, covering a core selection of the course material often resulted in more focused, rich online discussions.

Another frequently mentioned approach concerned a “flipped classroom”, where students were asked to view videos or listen to podcasts before class, thus allowing for more in-depth discussion during the online live sessions. Instructors who used a flipped classroom approach generally had positive experiences and noticed that it led to more active student participation and richer discussions:

I decided to give the recorded lectures that I had lying around from last year I in the beginning of the course so they could watch them, and then I did the shorter Zoom teaching. So I went through topics with the idea that they had watched it already and then really actively ask for questions and then give reactions. And what was really good, I had a lot more talks about the topics and discussed a lot more, because (. . .) they were much more willing to discuss or talk, so that, I got a lot more responses from them, so that was a benefit. (Tran, Faculty of Social and Behavioral Sciences instructor)

Students were also predominantly positive about this approach because it motivated them to better prepare and made them more confident about raising questions. However, students did emphasize that sufficient time has to be reserved for such sessions, as short sessions (e.g. 10-minute Q&A’s) only allowed for superficial discussions.

### ***Communicating about the course structure and clear expectations***

In addition to course restructuring, instructors felt they needed to provide clear information about the course structure to enable students to self-regulate their learning. Instructors used several channels to communicate this type of information, such as through Canvas (an online learning management system):



In Canvas, I have for every week exactly what the theme of the week is, exactly the material they need, self-assessment, exercises, and then also one of the things, just continuously reminding them of, okay, this is what we are doing this week. (...) I do that because they [online students] get confused very quickly about what they need to be doing, (...) they need a lot more structure in terms of knowing where they need to be and what they need to be doing. (Pablo, Faculty of Science instructor)

Instructors also used email, online announcements, or live sessions (usually the introductory session) to communicate about course activities or deadlines. Many students found such information helpful and felt comfortable in having more flexibility to do their own planning, though some students felt that they were given too much responsibility and struggled to effectively self-regulate their learning process. Several instructors indicated that they found it difficult to attend to such a diverse set of needs. Nearly all students did agree that clear expectations were important, and that these assisted them to better plan and structure their learning process.

Instructors also realized how important it was to set clear guidelines about mutual expectations in terms of online communication (keeping the camera on, maintaining an active posture, etc.), which they communicated through “netiquettes”:

You need to think beforehand, especially with large groups, how to communicate, what is allowed in the chat function, and how are you going to respond to the chat function? (...) So, let’s say you want them to ask questions in the chat. Will you respond to them straight away? Will you create some space later where you’re going to respond to all the questions? (Leonore, Faculty of Social and Behavioral Sciences instructor)

Instructors noticed that the first session would set the tone for the rest of the course. For example, if most students had their camera on during the first session, these generally stayed on for the remainder of the course, and vice versa if they were off. Although students had mixed views about the added value of keeping the cameras on, all students agreed that it was important to set clear expectations regarding the kind of online behaviour that was expected of them, as well as what they could expect from the instructors.

## ***Dimension two: facilitating discourse***

### ***Synchronous learning activities through breakout rooms***

When students had to collaborate when using videoconference software, they were mostly sent to breakout rooms to complete a small assignment. Instructors were fairly positive about using breakout rooms for online discussions and felt that students were actively engaged in such activities. Instructors could easily visit and switch between the breakout rooms to monitor and spark discussions. Breakout rooms also offered the opportunity for students to share their screen, which promoted interaction. One instructor further noted that in breakout rooms there is less background distraction: “breakout rooms have a certain level of serenity; it is just quiet” (Thomas, Faculty of Dentistry instructor). Students, on the other hand, were more mixed in their evaluation of breakout rooms. Many students mentioned that online discussions often remained superficial and

frequently complained about other students not participating and having their camera off. Nonetheless, students also liked the opportunity to be able to “lurk” in other breakout rooms when their own group was stuck. Further, breakout rooms urged students to interact and thus “really helped with [loosening] the whole atmosphere” (Judith, University College bachelor’s student).

Overall, a few conditions can be identified that are important to consider when implementing breakout rooms, according to instructors and students. First, the importance of a clear assignment was emphasized. It is important that students know what result is expected of them, and within what time frame. Without clear instructions, discussions in breakout rooms could go all over the place and were less beneficial. Second, instructors have to consider how the groups are formed, and by whom. Sometimes online discussions were most productive among students who knew each other relatively well, as students were less prone to interact with unfamiliar peers, whereas on other occasions it was better to use random assignment to let students interact with students they knew less well. The latter strategy was especially helpful for first-year students, as it provided opportunities to get to know other students. Third, both instructors and students indicated that discussions with an appointed discussion leader were more effective, because someone would actively take up the role to promote a smooth, fruitful discussion. Breakout room conversations – and online conversations in general – were experienced as flowing more organically when someone assigned speaking turns. Some even experienced these conversations to be more efficient than face-to-face conversations, because the online conversations were more structured and there were fewer interruptions. However, it was noted that leading online discussions can be tiring:

The most challenging part [of online teaching] was keeping [online discussions] interactive, and it was also the most tiring to me. You are kind of a presenter who is continually appointing people to answer the questions and to keep them focused. So you are always “on”. You cannot do nothing. (Ana, Faculty of Dentistry instructor)

### *Asynchronous group activities*

Some online courses had assignments that required students to collaborate asynchronously (e.g. writing a collective paper). In contrast to breakout room assignments, which were small and completed in a short session, asynchronous collaboration was usually part of larger assignments that had to be completed over a longer period of time. Asynchronous collaboration facilitated discourse, as students learned from their peers through direct collaboration with them, as well as through the work of other groups. In addition, students presenting to other students resulted in individual (asynchronous) learning, because students had to thoroughly comprehend the material themselves before being able to (synchronously) present it to others, also illustrating how asynchronous learning activities can complement synchronous learning activities. Students generally liked collaboration assignments because it “forced students to work together” (Arthur, Faculty of Science master’s student), which was particularly welcomed, as students often complained about a lack of peer interaction in online settings.

### ***Interaction among students in online meeting spaces***

Another frequently mentioned strategy to facilitate discourse came from instructors who arranged online meeting spaces that students could join at any time to ask questions or discuss with peers. Instructors themselves or student assistants were usually present to moderate interactions with and among students. Students had mixed feelings concerning instructors' attempts to facilitate online contact. Few students would stick around after class and it was often quiet during coffee breaks – usually the ideal moment to have a discussion with peers – because students left their computer. Nonetheless, those who did attend such meetings appreciated the opportunity to interact with peers. In addition to these instructor-led initiatives, students themselves would create chat groups to interact about course-related matters, thereby partially replacing the interaction that organically emerges in traditional classrooms:

The conversations between classes or . . . the little conversations, the little questions here and there that you have when the professor is talking. Just the little clarification questions, or during the breaks or after class, those are really important. (Elaine, Faculty of Social and Behavioral Sciences master's student)

### ***Dimension three: direct support***

#### ***Activating students***

Instructors struggled to activate students and noticed that the social norms are different in online settings compared to face-to-face settings. Students were less engaged in online activities than they were previously, and tended to switch off more easily. Instructors had to constantly stimulate interaction, more so than they would in a face-to-face context. Instructors' satisfaction with online tools to promote interaction (e.g. chats, collaboration tools, polls) varied, but nearly all instructors indicated that it required a lot of effort to consider which tools to use, figure out how to set them up, and monitor them. A few instructors also explicitly indicated that they lacked the required (digital) skills to use such tools effectively, and often felt insecure when using them. This did, however, result in knowledge of and experience with new tools and how these tools can enhance the learning climate. For example, instructors noticed that a chat lowered the barrier for students to engage in discussions by offering a non-invasive way of asking questions:

I noticed that in a chat more questions were being asked than in face-to-face lectures (. . .) It feels intrusive to ask a question during a face-to-face lecture. It feels like you are demanding [the] time of the instructor while you might have a stupid question, or [it] might not be relevant. (Carlos, Faculty of Science bachelor's student)

When multiple strategies were used, students said to learn in multiple ways: "I prefer an overload [of teaching strategies] so I can choose how I want to process the information, rather than prescribing a single way" (Jeroen, Faculty of Law bachelor's student). Ultimately, according to both instructors and students, it was not a matter of *which* strategies or tools were used; what mattered was *how* they were used. Using a chat, for instance, was only considered advantageous if the questions were discussed promptly.

### ***Online progress monitoring***

Instructors indicated that they missed the cues they normally use to monitor student progress and their needs. Many instructors often did not know whether students were following along, and this feeling was exacerbated when students kept their cameras off. One way of monitoring students' progress was through tools where students comment on each other's work, allowing instructors to view students' contributions:

I was often surprised by the level of the discussion. Both positively and negatively. (...) It is nice to see students explain things to each other. They do internet research, and some students do that really thoroughly if they want to understand something. I had never realized how heterogeneous our student population is. (Felix, Faculty of Economics and Business instructor)

Such tools allow instructors to gain insight into students' learning progress by assessing how students prepare, how long they work on assignments, and how well they understand the material.

Students equally felt that instructors often lacked insight into what students were doing during some of the learning activities. Moreover, instructors were not the only ones who needed to monitor students' progress. Students themselves also benefited from insights into their progress and used such insights to effectively self-regulate their learning process. As indicated in the quote above, peer feedback helped students to verify where they stood relative to other students. Most students indicated that such (often periodic) assignments helped them to get more insight into their progress and encouraged them to follow the pace of the course:

You could actually go through sections on Canvas, where you had theory, some examples, you could click "next" and then you would also get a quiz about the theory. So, it was really easy to access the material and identify at what points maybe you didn't comprehend the material enough to continue and you could back trace a few steps. (Arthur, Faculty of Science master's student)

A few students also mentioned that some of the monitoring assignments were experienced as an additional workload, because these were too big or complex for the time allowed.

### ***"Being there" for students***

"Showing care" by offering cognitive and emotional support is related to the notion of monitoring students' needs. On top of difficulties with identifying students in need of support in online settings, instructors struggled to offer that support remotely. Online education required them to actively seek contact with students:

If you want to make contact online, you almost have to [explicitly] announce that. You have to go the extra mile, and [in an online setting] that works differently than through non-verbal and formal communication in a face-to-face setting. (Giovanni, Faculty of Medicine instructor)

Instructors therefore set up additional opportunities for students to receive cognitive or emotional support outside of the scheduled contact hours, for example, by implementing "office hours", extra Q&A's, being available for instant messaging (e.g. WhatsApp), or having one-on-one meetings:

We had lectures of 2 hours, but we noticed students benefited from individual attention. So we shortened the lectures to 1 and a half hour and used the extra half hours for individual meetings (Lea, University College instructor)

To reduce the emotional distance between students and their peers and instructors, some instructors started each online class with an informal, more playful activity, such as asking students about their weekend, mentioning last night's important sports match, or sharing personal leisure-time videos. Using light conversation and humour as a way to lighten up the class atmosphere not only made sessions more entertaining, it also created "cognitive breaks" that gave students time to process the course material. In general, most instructors and students liked such "icebreaker activities", although it was also emphasized that the emotional connection that arises during face-to-face activities could only be partially attained through online alternatives.

When students were asked what kind of support they mostly missed, they emphasized the importance of emotional support. Instructors who visibly invested much time in "being there" for students were valued most by students:

[The instructor] was very kind and understanding. At first, she did not know about the personal situation of students, but she asked us and did some adjustments. For example, she changed a mid-term assignment. That was very nice. (Titus, Faculty of Humanities bachelor's student)

Students particularly showed their appreciation for instructors who exposed some personal aspects of their life: "It was amazing to see instructors in their home environment. (...) It really felt like instructors are also human" (Danielle, Faculty of Economics and Business master's student).

## Discussion

In this study, we examined which online teaching strategies were used to facilitate cognitive and social processes when all courses had to shift to online settings following the COVID-19 pandemic, as well as how these strategies were experienced by both instructors and students. Our results showed that instructors orchestrated cognitive and social processes both before and during the course through course design, facilitation of discourse and direct support (i.e. teaching presence), but that students did not always pick up on these strategies or evaluated the usefulness of them differently.

When designing the course, instructors carefully considered how the learning activities would facilitate social interaction and how these interactions could lead to (collaborative) learning. To this end, instructors restructured their courses to maximize opportunities for interaction (e.g. dividing students into smaller groups, adopting flipped classroom approaches) and designed specific learning activities to foster interaction (e.g. breakout room activities, collaborative research projects, and opportunities to meet in online spaces). Importantly, instructors indicated that they were more aware of their design choices and the need to be explicit about their expectations related to course goals, learning activities, and online communication behaviours so as to better facilitate student learning. A coherent course structure and clear expectations were highly valued by students, because these enhanced their ability to self-regulate their learning process. Previous research has similarly emphasized the importance of

careful advance planning of the course (Kaufmann & Vallade, 2020; Schwenck & Pryor, 2021), which turned out to be particularly important in online settings, as there is less room for “on the fly” clarifications compared to traditional on-site teaching (Castro & Tumibay, 2021).

During the course, instructors promoted cognitive and social processes via two forms of teaching presence: facilitating discourse and offering direct support. Facilitating discourse is one of the most challenging aspects of online teaching (Dalley-Hewer et al., 2012; Stodel et al., 2006). Instructors facilitated discourse by letting students interact, both synchronously (e.g. breakout room activities and having students present to each other) and asynchronously (e.g. take-home assignments and message boards). For example, collaboration activities promoted social processes as a result of the interactions among students and promoted cognitive processes inasmuch as students learned from each other. Instructors were crucial actors in fostering meaningful dialogues by carefully monitoring the interactions and by encouraging students to explore new concepts, similar to how an instructor would walk around in a physical classroom. Moderating online discussions was experienced by both instructors and students to be a crucial task to elicit fruitful online interactions, as these flow less organically due to the nature of online interaction (Godhe & Wennås Brante, 2022; Stodel et al., 2006) and having less engaged students (Castelli & Sarvary, 2021; Kebritchi et al., 2017). It was experienced as an exhausting task, however, since instructors needed to continually elevate surface-level interactions to more deep, sustained forms of online interaction (Garrison & Cleveland-Innes, 2005).

Direct support was offered in terms of both cognitive support (e.g. providing feedback, offering ways for students to monitor their progress) and emotional support (e.g. facilitating informal interaction opportunities, “being there” for students). Although most instructors became more aware of the different aspects of their versatile role as an instructor – a role that may have been taken for granted in on-campus teaching – not all students felt they received adequate cognitive and emotional support. Instructors who carefully considered how they were going to fulfil these aspects through online activities were valued more than instructors who were less aware of these aspects. Light conversational techniques (e.g. using humour, telling personal anecdotes) helped to reduce the emotional distance between instructors and students, and made students more inclined to request support and more receptive to feedback. The results underline how instructors need to “provide administrative, pedagogic, and affective or pastoral support” (Hammond, 2005, p. 17).

In addition, we found that in some cases instructors’ experiences were not congruent with students’ experiences. For example, instructors were quite enthusiastic about breakout rooms, while some students were far more critical of the use of breakout rooms and often indicated that these were not used effectively. Although establishing the actual effectiveness of these strategies would require additional quantitative methods, such observations confirm earlier findings suggesting that instructors’ view of what are successful teaching strategies may differ from students’ experiences (Caskurlu et al., 2020). Moreover, differences were not just found between students and instructors; students themselves were also divided concerning the usefulness of certain strategies. For example, some students were in dire need of more social activities, whereas others would find those a waste of time. Similarly, some students flourished in a setting that allowed for

much self-regulation, while some wanted more support. This highlights how each strategy impacts students differently, and how important it is for instructors to consider how they can effectively attend to a wide variety of student needs (Fiock, 2020).

### **Limitations**

This study was conducted during the pandemic, which unquestionably impacted how instructors and students experienced the online transition. We conscientiously attempted to separate COVID-related issues from general online learning principles, but follow-up research should determine whether this study's findings are indeed transferable to other online learning settings. In line with many other researchers (e.g. Sahu et al., 2022; Wangenge-Ouma & Kupe, 2022), we too argue that teachers' and students' experiences with emergency remote teaching can aid the (re)design of online teaching strategies that are valuable beyond pandemic circumstances.

Furthermore, we strived for maximum variation in the sample to hear about a wide variety of experiences, but selection bias may have affected the findings through the inclusion of overly enthusiastic or overly gloomy instructors and students.

Lastly, it proved very difficult to distinguish social processes from cognitive processes during the analysis. All activities that contain some form of interaction inherently yield a social component and nearly all activities in a university context yield a cognitive component. While this highlights the interconnectedness of the elements in the Col framework, it made it difficult, if not impossible, to make inferences about the impact of online teaching strategies specifically on cognitive or social outcomes.

### **Research recommendations**

This study's approach combined a teaching-centred perspective with a more learning-centred perspective. It illustrates how students evaluate online teaching strategies differently depending on their learning preferences. As such, the effectiveness of any online teaching strategy (e.g. how much and at what stage instructor support has to be offered) highly depends on what online learning strategies students deploy (see also Pool et al., 2017; Wertz, 2022). To gain a better understanding of the impact of online teaching strategies, future research may consider relating the teaching strategies directly to students' online learning strategies.

Further exploration is also necessary concerning the effectiveness of online teaching strategies in (domain-)specific contexts, as related to specific learning goals, and for a specific student population. Questions have been raised concerning the generalizability of the Col framework and how it holds up across a wide variety of contexts (Castellanos-Reyes, 2020; Garrison & Arbaugh, 2007) and disciplines (Richardson et al., 2012). The strategies described in this study were identified across a wide range of courses, across multiple domains, at different levels, and with different online education setups, suggesting that they are general rather than domain-specific, though further research should verify whether that is truly the case.

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No potential conflict of interest was reported by the author(s).

## Notes on contributors

*Chevy van Dorresteijn* was an educational researcher at the Research Institute of Child Development and Education, University of Amsterdam, The Netherlands. He is now with the Faculty of Behavioural and Movement Sciences, Vrije Universiteit Amsterdam, The Netherlands. His research primarily focuses on online learning and teaching, and students' professional identity development.

*Monique Meij* was an educational researcher at the Research Institute of Child Development and Education, University of Amsterdam, The Netherlands. She is now with the Faculty of Technology at the Amsterdam University of Applied Sciences in the Netherlands. Her areas of interest are quality assurance and accreditation in higher education.

*Natalie Pareja Roblin* is an assistant professor at the Research Institute of Child Development and Education and a policy researcher at the Teaching and Learning Centre of the University of Amsterdam, Netherlands. Her main research topics are educational innovation and teacher professional development within higher education.

*Frank Cornelissen* is a professor of Innovation in Education at the Research Institute of Child Development and Education, University of Amsterdam, The Netherlands. He has worked in the field of education as a teacher, consultant, lecturer, and senior policy advisor. His research area focuses on educational innovation, with a specific focus on the (social) process of (sustainable) innovation and the role of the teacher.

*Joke Voogt* is an emeritus professor of Curriculum and ICT at the Research Institute of Child Development and Education, University of Amsterdam, The Netherlands. Her main research topic concerns the integration of technology in teaching and learning, in particular with respect to the curriculum and the role of the teacher.

*Monique Volman* is a professor of Education at the University of Amsterdam. She works at the Research Institute of Child Development and Education, University of Amsterdam, The Netherlands, where she leads the Educational Sciences programme. Her main areas of research are educational innovation, facilitating learning environments for meaningful learning, and inequality and diversity in education.

## ORCID

Chevy van Dorresteijn  <http://orcid.org/0000-0002-6240-185X>

Natalie Pareja Roblin  <http://orcid.org/0000-0001-9809-9931>

Frank Cornelissen  <http://orcid.org/0000-0002-6037-961X>

Joke Voogt  <http://orcid.org/0000-0001-5035-9263>

Monique Volman  <http://orcid.org/0000-0001-9217-1402>



## Data availability statement

The participants of this study did not give written consent for their data to be shared publicly, so due to the sensitive nature of the research, supporting data are not available. The focus group protocols and coding scheme can be accessed via <https://doi.org/10.17605/osf.io/cykh8>.

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