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K–12 Students' Experiences of the Synchronous Remote Teaching and Learning Environment

MARIA LINDFORS
Umeå University, Sweden
maria.lindfors@umu.se

FANNY PETTERSSON
Umeå University, Sweden
fanny.pettersson@umu.se

The use of online, distance, and remote teaching is a growing phenomenon in the K–12 context. The aim of this pilot study was to explore K–12 students' experiences of the synchronous (real-time) remote teaching and learning environment. The following research questions were posed: (1) What possibilities and challenges can be identified from the perspective of students? (2) What development needs can be discerned for unexperienced teachers and students in synchronous remote teaching and learning environments? Data were collected from 177 students, using a quantitative instrument with questions in four dimensions: teacher support, involvement, cooperation, and autonomy support. Findings reveal both possibilities and challenges experienced by students in the synchronous remote teaching environment.

Keywords: online, K–12, students, synchronous, remote, virtual, WIHIC

INTRODUCTION

Online, distance, and remote teaching is a growing phenomenon in the K–12 context. Because of unpredictable situations such as earthquakes (Baytiyeh, 2018) and, more recently, the COVID-19 pandemic (Yandell, 2020), many countries temporarily closed their schools, meaning that online learning becomes one option for many students to learn (Bond, 2021).

Aside from these exceptional situations, there are other societal and regional challenges that in the long-term require new digital solutions for equal access to teaching and learning (Iliomäki & Lakkala, 2020; Stenman & Pettersson, 2020). Even before COVID-19 there were, for example, challenges of urbanization, lack of certified teachers, diminishing birth rates, difficulties in filling the classrooms, and long distances between schools and peoples' homes (Barbour & Hill, 2011; Clark, 2003). These societal needs have forced digital and educational development, often led, innovated, and accelerated in rural areas (From et al., 2020; Pettersson & Olofsson, 2019; Siljebo, 2020). Thus, in an international context, such stable and long-term development has resulted in various solutions for synchronous (real-time) and asynchronous (not real-time) learning for lectures, school days, or even full-time online learning, at all levels of K–12 (Barbour, 2015). The remote teaching solution focused on in this paper is what Barbour (2018) described as supplemental online learning, where students are "enrolled in a brick-and-mortar school but take one or more courses from an online provider to supplement their face-to-face learning" (p. 25,).

Some previous research has focused on online teaching in its various forms (Barbour, 2019; Billmayer et al., 2020). Some studies have focused on the experience of teachers (Crouse et al., 2018); however, as Toppin and Toppin (2015) articulated, there is a lot to be discovered regarding K–12 students' perceptions and experiences learning online. The current study focuses on student experiences. Another contribution of this study is to address the lack of research into synchronous online teaching (Barbour, 2013, 2015; Rehn et al., 2018). One reason for this lack, as Barbour (2015) explained, is "that the vast majority of online instruction that occurs within the K-12 online learning environment is asynchronous in nature" (p. 2). Against this backdrop, the aim of this pilot study is to explore K–12 students' experiences of the synchronous remote teaching learning environment. The following questions were posed:

1. What possibilities and challenges can be identified from the perspective of students?
2. What development needs can be discerned for unexperienced teachers and students in synchronous remote teaching and learning environments?

PREVIOUS RESEARCH

In this section, previous research on online, distance and remote teaching is presented. Aspects of the teaching and learning environment with a specific focus on students' experiences and perceptions are discussed.

Teaching and Learning Environment

To date, research on students' perceptions and experiences of online, distance, and remote teaching and learning is scarce (Barbour et al., 2012; Borup et al., 2019; Borup & Stevens, 2017; Harvey et al., 2014). Studies on students' perspectives have mainly been conducted in the field of higher education, focusing on adult learners (Harvey et al., 2014; Ilomäki & Lakkala, 2020). As Borup et al. (2019) discussed, compared with adult learners, K–12 students are younger, are often less experienced, and require other types and levels of interaction and support. Thus, a general research conclusion is that structures for help and support, building strong relationships, and a sense of community are important aspects for K–12 students' learning and satisfaction (Borup et al., 2019; Borup, et al., 2014; Cavanaugh, et al., 2009; Ilomäki & Lakkala, 2020).

Synchronous and Asynchronous Teaching and Learning

The most prominent use of K–12 online learning appears to be asynchronous solutions (Barbour, 2013, 2015; Barbour & Adelstein, 2013). Simultaneously, research suggests that synchronous online teaching and learning is important for students' learning and satisfaction. As Rehn et al. (2018) articulated, "synchronous is superior to asynchronous online learning because it increases rich interpersonal communication . . ., creates social presence . . ., and gives more opportunity for teacher immediacy behaviors" (p. 418). Similarly, Barbour (2015) and Barbour and Hill (2011) found that students and teachers were more active and productive during synchronous lectures. Barbour (2015) concluded that students developed a strong sense of community during their synchronous lectures, yet teachers are underprepared to engage in synchronous online teaching and learning. Additionally, Rehn et al. (2018) concluded that "teachers are largely under-prepared with strategies to project presence, develop relationships, foster interaction, manage the course and teach content across a distance when the screen is the main tool of connection" (p. 417).

Interaction, Relationships, and Sense of Community

Borup and Stevens (2017) showed that strong relationships, dialogue, and personal instruction are critical factors that can help teachers to understand, meet, and respond to students' learning needs in synchronous online learning environments. Reliable relationships can support students to explain and visualize their problems while working with tasks. As Barbour (2015) described, strong relationships and a sense of community are also important factors for productive communication and interaction in class. According to Barbour (2015), when the sense of community increases,

so does verbal communication, and vice versa. Thus, Barbour (2015) argued that teachers need to help their students to promote a sense of community built on trust and support that can "encourage students to be more active and, in particular, vocal in their participation" (p. 63) during synchronous online sessions. As Borup, Graham, and Velasquez (2013) argued, however, building caring relationships itself requires active participation. It has also been concluded that "online teachers in the synchronous environment actually relied more on teacher-focused rather than student-centered approaches" (Barbour, 2015, p. 56,). Moreover, there is a "need for online teachers to be better trained to utilize the synchronous tools beyond what they have been conditioned to do in the face-to-face environment" (Barbour, 2015, p. 63).

Several studies indicate that students, when given the choice, prefer texting to talking when interacting with online teachers and other peers in the virtual classroom (Barbour, 2015; Murphy & Murphy, 2010; Nippard & Murphy, 2007). According to Barbour (2015), some groups of students feel shy about using the microphone for verbal communication and prefer smaller class sizes. In their study, Nippard and Murphy (2007) found that teacher and student interactions "relied on different tools when providing affective, interactive and cohesive responses related to social presence. Manifestations of social presence by the teachers occurred through use of two-way audio, whereas students relied on text-based Direct Messaging" (p. 1). According to Barbour (2015), this phenomenon could be explained by students experiencing interaction to be easier and more effective using chat messages. This manifestation in turn can be considered problematic, as texting per se can affect how social interaction is manifested. Consequently, things like body language and nuances in expressions become less prominent and more difficult to interpret. Therefore, and in line with what Murphy and Murphy (2010) highlighted in their results, it is important that students are introduced to and made aware of what it is like to communicate and interact digitally in class. Pettersson and Hjelm (2020) and Pettersson (2021) argued that school organizations need to support students' in-depth understanding of the affordances and constraints of the digital learning context.

Structure and Support

Another aspect discussed in research is students' need for structure and support. In a study conducted in Finnish upper secondary school, students experienced the structure and organization of online courses to be essential for their learning and satisfaction (Ilomäki & Lakkala, 2020). Borup et al. (2019) investigated students' perceptions of support provided by their on-site facilitator and online teacher. Their study revealed that student support was mainly received from the on-site facilitator, with an exception for specific content-related support. Due to the physical distance of online

teachers, students described it to be easier to seek help and support from other peers, the on-site facilitator, and other adults in school. Moreover, autonomy support has been confirmed by other researchers as an influential strategy to enhance online and remote students' motivation, engagement, and peer collaboration in class (Lee et al. 2015; Cullen & Harris, 2018). On the other hand, Murphy (2010) argued that "teachers' initial adjustment to students working on their own on the computer resulted in concerns of multi-tasking and an inability to address the needs of students doing different activities within the one classroom" (p. 18).

Experiences from Emergency Remote Teaching

There are also studies focusing the experiences during the COVID-19 pandemic. The pandemic and emergency remote teaching have led to new digital and educational insights and solutions but have also caused additional stress for schools, teachers, and students (Kim & Asbury, 2020). For example, schools had limited time to prepare for going online, and different teachers and students had different competencies, technical and material resources to teach and learn from home (Yandell, 2020). In a research review, Bond (2021) found that while some students appreciated the freedom in the emergency remote teaching environment, other students felt isolated and lacked the feeling of social presence. Bond (2021) additionally found that many studies discussed the importance of supporting students' development of self-regulation (cf. Sulisworo et al., 2020) and the digital competence needed to navigate and learn in the emergency remote teaching environment. Other studies have shown that teachers themselves often are unprepared to meet technological (Putri et al., 2020), pedagogical (Trust & Whalen, 2020) and relational challenges (van de Spoel et al., 2020) when going online. For example, Van der Spoel et al. (2020) showed that teachers found it difficult to support students' well-being and sense of community in the emergency remote teaching classroom.

METHODS

The aim of this study is to explore K–12 students' experiences of the synchronous remote teaching learning environment. Since July 2015, remote teaching has been regulated in the Swedish Education Act. According to the education act, the K–12 remote teaching is allowed only in specific subjects (modern languages, mother tongue tuition, and study guidance) when a certified teacher is not available. According to the regulation, (a) remote teaching must be conducted synchronously, (b) the pupils should be in the physical classroom, and (c) a facilitator must always be in the same

room. This means that students are separated in the physical space but not by time.

This study is based on data from a research and development project conducted in eight Swedish schools using online teaching for modern language learning (Spanish, German, and French) in Grades 6–9. Municipalities in this region are large in area, have few inhabitants, and have an aging population due to increased urbanization. The region is also characterized by small school units, long distances between schools, and lack of certified teachers. The joint municipal challenges have contributed to collaboration and partnership in the region, with the ambition to, with common forces, increase the quality of teaching and learning. One example is the joint recruitment and employment of teachers in modern languages who, with the help of remote teaching, could be used by and made available to the entire region.

During the research and development project, focusing development of remote teaching and learning, schools and teachers experienced the need for tools that could be used to systematically evaluate the use of, and conditions for, remote teaching, during but also after the end of the project. As a joint activity between teachers, researchers and school leaders, an evaluation instrument was developed. An important goal of the activity was that schools (teachers, on-site facilitators, and school leaders) would be responsible for designing and distributing the instrument and thereafter analyzing and implementing necessary changes. This analysis and implementation would be conducted with support from researchers in the project.

Instrument and Procedure—Perceptions of the Classroom Characteristics

To evaluate perceptions of the learning environment a quantitative questionnaire including a few opened questions for generating qualitative data were developed and used. A Swedish adaptation of selected scales (teacher support, involvement, and cooperation) from the What Is Happening In this Class (WIHIC) questionnaire by Fraser et al. (1996) was used, in combination with the aspect of perceived level of autonomy support provided by the teacher from the Learning Climate Questionnaire (Williams & Deci, 1996).

Students' perceptions of their classroom's psychosocial climate have been shown to be consistently associated with their affective and cognitive outcomes in learning contexts (Chionh & Fraser, 2009). The WIHIC questionnaire is one of the most frequently and widely used instruments because it, in a reliable and useful way, assesses numerous aspects of the learning environment that include interactions between students and interactions between the teacher and students. The instrument has been used in numerous studies involving various subject areas, different grade levels, and use of technology in education (e.g., Charalampous & Kokkinos, 2017; Chionh & Fraser, 2009; Fraser & Raaflaub, 2013). Moreover, it can provide important feedback to teachers to improve the learning environment.

Autonomy support clarifies students' perceptions of the extent to which their teachers make them feel understood, listened to, and accepted, as well as confident in their abilities (Williams & Deci, 1996). According to Cheon et al. (2019), autonomy support refers to a group of behaviors that aim to nurture students' internal motivational resources—that is, to strengthen students' sense of empowerment and self-control in their behaviors by, for example, offering students meaningful choices, encouraging students' initiatives, giving them personally meaningful rationales for task engagement, and giving them opportunities for self-initiated behavior. Therefore, the learning climate a teacher creates in the classroom will influence students' perceived autonomy (Black & Deci, 2000). In addition, students' perception of autonomy support has been shown to be a key factor in promoting positive educational outcomes (Su & Reeve, 2011), as well as in supporting interpersonal relationships in the classroom (Chrikov & Ryan, 2001).

The instrument included four dimensions: teacher support, involvement, cooperation, and autonomy support.

Table 1

Four Dimensions Included in the Instrument

Subscale	Description
Teacher support (WIHIC)	The degree to which the teacher helps, befriends, trusts, and is interested in students
Involvement (WIHIC)	The degree to which students have attentive interest, participate in discussions, do additional work, and enjoy the class
Cooperation (WIHIC)	The degree to which students cooperate rather than compete with one another on learning tasks
Autonomy support (Learning Climate Questionnaire)	The degree in which students perceive that their teacher support student's autonomy in the classroom

The questionnaire consisted of 13 statements rated on a 5-point Likert scale (*1 = strongly disagree; 5 = strongly agree*), as well as four open-ended questions. All items/questions were situated in the context of remote teaching and were positively worded. The instrument with its specific content was designed in close collaboration with stakeholders such as the remote teachers and remote coordinators. Combining results from statements and open-ended questions was aimed at offering a deeper understanding of how students experience and position themselves in the remote learning environment and in relation to their peers and teachers.

Participants

Included in this study, are students in Grades 6–9 (12–16 years old) in one region who were participating in remote modern language education and were invited to respond to the online self-report questionnaire under teachers' and on-site facilitators' supervision. Out of the 192 students that were invited to participate, a sample of 177 responded (92%) in May 2020. Students were given information about the general aim of the evaluation instrument and were informed that data, on group level, would be used for research. Information on participants' names, schools and other personal characteristics were not included in this data. Students were also assured that the data would be handled to protect their privacy. Participation was on voluntary basis, and no compensation was provided.

Analyzing Free-Text Statements

Statements (N = 804) from the four open-ended questions were processed in a data cleaning procedure, meaning that nonsense statements such as "I don't know," "…," and so on were manually removed from the data set. Remaining statements (N = 403) were analyzed following the structure of a Thematic analysis method (Bryman, 2015) using the program NVivo. Using thematic analysis, we were able to identify important data from a data corpus by going through data repeatedly with the intention of finding new patterns, themes, and subthemes. In practice, statements were given code names such as technology, communication, ask questions, and so on. Thereafter, similar codes were placed into broad emerging themes. As a final step, all themes were analyzed with the aim of finding other possible themes of content. This process resulted in seven main themes: (a) teachers' overview in class, (b) individual help and support, (c) communication in class, (d) student-centered learning, (e) digital technologies, (f) certified teachers, and (g) enhanced flexibility.

RESULTS

In this section, results from the Web-based survey are presented. As a pilot study, including rather few statements and a small sample, the average of each statement is presented. Thereafter, subthemes generated from the open-ended questions are presented.

Table 2
Average Subscale and Statements

Subscale	Item	Average
Cooperation 3.76	When I work in groups in this class, there is teamwork.	3.87
	I work with other students in this class.	3.8
	I cooperate with other students when doing assignment work.	3.62
Teacher support 3.42	The teacher helps me when I have trouble with the work.	3.55
	The teacher is interested in my problems.	3.52
	The teacher checks in with me.	3.18
Involvement 3.3	I discuss ideas in class.	3.6
	I give my opinions during class discussions.	3.16
	I ask the teacher questions.	3.13
Autonomy support 3.18	My teacher makes sure there is a good working climate in the classroom.	3.33
	If I do not know what to do during the lesson, my teacher will see it and come and help me.	3.11
	My teacher makes sure that I learn what I am supposed to during the lessons.	3.1

As Table 2 shows, cooperation between students in class and support from the teacher are the highest rated subthemes. Many of the statements show that students appreciate teamwork and collaboration with peers in the remote learning environment. Also, there seems to be a strong sense of community and involvement in the student groups in terms of communicating and discussing with each other in class. Teachers' interest and support when students face problems with tasks during class is relatively highly rated. However, this help and support from teachers appears to be dependent on students giving their teachers a heads up when having problems. As indicated in statements related to autonomy support, teachers' possibility of checking in with students and teachers' control of students individual learning processes are rated the lowest. This result might be related to teachers' difficulties to overview in class and to see when certain students don't know what to do during the lesson. These indications appear more clearly in the table below.

Table 3
Average of Rated Statements, From Highest to Lowest

Item	Average
When I work in groups in this class, there is teamwork.	3.87
I work with other students in this class.	3.8
The on-site facilitator supports me in class.	3.64
I cooperate with other students when doing assignment work.	3.62
I discuss ideas in class.	3.6
The teacher helps me when I have trouble with the work.	3.55
The teacher is interested in my problems.	3.52
My teacher makes sure there is a good working climate in the classroom.	3.33
The teacher checks in with me.	3.18
I give my opinions during class discussions.	3.16
I ask the teacher questions.	3.13
If I do not know what to do during the lesson, my teacher will see it and come and help me.	3.11
My teacher makes sure that I learn what I am supposed to during the lessons.	3.1

A category that emerges from the data but does not exist as a subtheme is teachers' overview in class. This subtheme is also evident in the free text answers. As Table 3 shows, there are strong indications that students experience remote teachers' difficulties in overviewing class when the screen is the primary tool for interaction. At the same time, students experience themselves as receiving help, support, and interest from their teacher but not how this help is initiated when teachers cannot easily see the students. According to the results, receiving help might depend on students' own involvement and articulation when facing problems. Table 3 also shows the importance of the on-site facilitator when it comes to help and support in the classroom. However, there is only one statement related to this role. The most highly rated statements are all related to teamwork and cooperation in class. Students seem to help each other and work well together with tasks and assignments.

Results From Free-Text Answers

In this section, subthemes generated from the analysis of students' free-text answers are presented. Subthemes focus on students' experiences of the remote learning environment and presented as follow: (a) teachers' overview in class, (b) individual help and support, (c) communication in class, (d) student-centered learning, (e) digital technologies, (f) certified teachers, and (g) enhanced flexibility.

The first theme, *teachers' overview in class*, highlights the teachers' opportunities to get an overview of what is happening in the actual learning environment and where the students are in their learning. In the online environment, the teacher cannot wander around among the desks and see what students are doing or not doing: "the teacher cannot walk around [the] classroom and check how you are doing." If, for example, attention is paid to some individual students, the teacher risks missing what the large mass of students does and if something else happens in the learning environment. This finding is shown in quotes from students as follows: "the teacher seems to have a hard time seeing if people need help," "the teacher does not seem to hear," and "the teacher probably has a harder time making sure everyone does what they have to do."

The second subtheme concerns the lack of *individual help and support* in the remote learning environment. The students' experience is that the format makes it more difficult and complex to explain problems and gain access to the right kind of support from the teacher: "you do not get the same contact with the teacher as normal" and "you cannot take the teacher [aside] and talk." According to students' statements, the teacher does not seem to have the opportunity to visually see where the students are or where they are stuck in their schoolwork, and it is more difficult for the students to explain their needs in the same way as in a traditional brick-and-mortar classroom context. For example, as some students expressed, "It is much more difficult to explain problems when you don't have the possibility to show and visualize in the same way as before," "it is difficult to get help when teachers cannot see exactly what you have done and are doing," "it is a bit difficult to explain through a computer," and "you cannot really show your problems."

The third subtheme deals with the prevailing climate for *communication in class* and what consequences unasked questions might have for students' learning in the long run. Among other things, the students mentioned that it is perceived as difficult to be able to take the teacher aside to ask questions without the rest of the class hearing and knowing about it. Students who are not very driven and outgoing can in this format experience difficulties in daring to discuss with and vent to the teacher. This issue seems to be particularly difficult for shy students: "it is difficult to ask questions, especially for shy students," "if you don't dare to ask questions in

front of the entire class, then you don't ask questions," and "it is difficult for me to ask [questions] and talk to the teacher, because I don't want the entire class to hear." Other students feel anxious about disturbing classmates if they are asking questions and talking to the teacher on the classroom screen: "It should be easier to ask questions during class, without disrupting and disturbing the rest of the class." Thus, several students put forth a desire to have alternative ways to "ask questions without having other students listening."

Taken together, all three subthemes mentioned above indicate that the teacher might find it difficult to meet the students where they are in terms of knowledge. In other words, it becomes difficult for the teacher to conduct individualized teaching where all students' special needs are met, which applies to both students who have significant difficulties and those who have particularly good access to learning and instead need to be challenged and stimulated further.

The fourth subtheme deals with the balance between *teacher- and student-centered learning* in the remote learning environment. When the screen is the main tool for learning and interaction, several students experience the teacher as the main figure in class: "It easily becomes a heavy focus on the teacher" and "it is very often the teacher talking in class." Thus, several students experience themselves as passive receivers of knowledge and information in the remote learning environment. Some students wish to become active participants in the remote learning environment: "I would like to work more myself instead of having the teacher going on and on talking," "I would be better with short and effective introductions and then time for us to start working," and "the teacher could preferably talk less and instead supervise me in the learning environment." Furthermore, the students want greater clarity regarding what they should work on and how long the activity should last.

The fifth theme concerns *digital technology*. An aspect that students pay attention to that is important for their retention of remote learning is the perceived and recurring technical problems. In this fifth subtheme, the students' statements testify, for example, that the internet often does not work, that the teacher and students can have great difficulty getting into the digital classroom where teaching is expected to be conducted, and that sound and images freeze, which can easily create misunderstandings between teachers and students. Students stated, "They [the images] freeze sometimes, and it can sometimes be bad sound," "sometimes it is not possible to connect at all," and "it is difficult when there are bugs because then there are often misunderstandings." Overall, the students also put forth possibilities with the remote teaching format. The sixth subtheme and most prominent benefit students expressed is the possibility of being *educated by a certified teacher.* Due to the lack of workforce in rural areas, students are sometimes educated by noncertified teachers, and in other cases, the specific subject or language is not even offered to students. Students expressed this as follows: "Our school consists of quite a few teachers. Remote teaching means that we can

be taught by a teacher who lives elsewhere, and the students get the education they should get." Other students indicated that due to remote teaching, "we can be offered modern languages. Remote teaching means that we have [the] possibility to choose what language to learn." Some students explained the specific benefit of having a certified teacher as follows: "We have a trained teacher who can set grades." Moreover, students "get a teacher who is trained and knows the language to be learned" and "the teacher to 100% who knows what the students need to know" in the specific subject.

Finally, the students emphasized the positive aspects of the *enhanced flexibility* that remote teaching entails. In this subtheme, it appears that the remote teaching environment makes it possible for everyone involved to be able to participate in the learning process, regardless of whether they are at home, ill, and so on: "It doesn't matter if the teachers appear to be a bit sick," "it is possible to participate in the learning process even if you have to stay at home that day," "it is great to [be] able to participate even if you are staying home sick," and "everyone can participate, regardless of physical location."

DISCUSSION

Online, distance, and remote teaching is a growing field of research in the K–12 context. Within this field, however, focus has primarily been on the use of asynchronous remote teaching, with a specific focus on the experience of teachers (Barbour, 2015; Billmayer et al., 2021). This means, as Toppin and Toppin (2015) articulated, that there is a lot to be discovered regarding K–12 students' perceptions and experiences of learning in online settings (Barbour et al., 2012; Borup et al., 2019; Borup & Stevens, 2017; Harvey et al., 2014; Iliomäki & Lakkala, 2020). This study should be seen as a pilot, giving an indication of the possibilities and challenges students might experience in the synchronous remote teaching environment. As revealed in the study, synchronous remote teaching entails many possibilities for students' learning and development. Students value the possibility to learn from and interact with a certified teacher and in a language previously not available to learn in the rural area. According to students' experiences, the synchronous remote learning environment also contributes to a sense of community among students, and the collaborative learning is highly valued among students. This was also noticed by Rehn (2018) and Barbour and Hill (2011): Students often appear to be active and productive during synchronous remote teaching lectures. Moreover, synchronous remote teaching is important for students' learning and satisfaction, as it increases collaboration and interpersonal communication in class (Rehn et al., 2018). The results also indicate the importance of having an on-site facilitator in the same room, facilitating the learning and interaction.

Based on the results of this pilot study, however, there are also perceived challenges expressed by students. One of these challenges, for example, seems to be how teachers can engage students at a distance and how they can help and support them to learn and interact in this environment (Borup et al., 2019; Borup, Graham, & Drysdale, 2014; Cavanaugh et al., 2009; Ilomäki & Lakkala 2020). Compared with a traditional in person classroom, in remote education, the teacher does not have the opportunity to wander around and "read the room" in the same way and can therefore not easily determine how the students are working. Thus, according to the findings, students sometimes experience a distance from the teacher, who in turn does not seem to have a complete overview of when students need help, where the students are in their individual learning processes, and what support students might need. Moreover, students' experience is that the format makes it more difficult and complex for them to explain problems when the teacher cannot sit beside them. As Murphy and Murphy (2010) pointed out, "teachers' initial adjustment to students working on their own on the computer resulted in concerns of multi-tasking and an inability to address the needs of students doing different activities within the one classroom" (p. 18). Taken together, these aspects indicate that, for example, unexperienced teachers might find it difficult to conduct individualized teaching where all students' special needs are met, which applies to both students who have significant difficulties and those who have particularly good access to learning and instead need to be challenged and stimulated further.

Borup and Stevens (2017) concluded that strong relationships, dialogue, and personal instruction are critical factors that can help teachers to understand, meet, and respond to online students' learning needs. At the same time, Rehn et al. (2018) stated, for example, that "teachers are largely under-prepared with strategies to project presence, develop relationships, foster interaction, manage the course and teach content across a distance when the screen is the main tool of connection" (p. 417). Synchronous remote teaching can make teaching more complicated for teachers, and it can also make learning more complicated for students. Because the teacher cannot visually see where the students are or if they get stuck in their schoolwork, higher demands are placed on the students themselves to have the insight, maturity, and willingness to demand attention from the teacher and obtain access to the right kind of support. At the same time, as Borup et al. (2019) discussed, K–12 students are, compared with adult learners, often less experienced and require other types and levels of interaction and support. Regardless of being in a remote learning environment or in a traditional classroom, students might lack insight into what difficulties they face in their learning process. Therefore, it is important that teachers and students explicitly discuss the affordances and constraints of the new

learning environment to facilitate and enable well-functioning communication and to provide students with tools and readiness for action in learning situations where they find themselves having trouble. From this point of view, synchronous remote teaching and learning to a higher extent requires students to be responsible for their learning. It is therefore crucial to understand how students can be engaged at a distance and how students' learning autonomy can be strengthened. Put differently, students need to learn how to learn in the new digital learning environment (Pettersson, 2021; Pettersson & Hjelm, 2020).

The synchronous remote teaching environment can also be discussed in terms of instructional strategies that teachers use to motivate their students to engage more deeply in their learning, such as a balance between requirements and freedom in tasks (Borup et al., 2019; Ilomäki & Lakkala 2020). This discussion can also be seen as the relationship between teacher- and student-centered learning, where there could be tensions between the teacher's requirements and expected learning outcomes of their students and the students' opportunities for freedom in their own learning in the remote learning environment (i.e., their learning autonomy). Some students emphasized the teacher as the main player who talks, directs, and sets the rules for the remote learning environment. This emphasis was recognized by Barbour (2015), who found that "online teachers in the synchronous environment actually relied more on teacher-focused rather than student-centered approaches" (p. 56). However, in this case, although being a small case, several students appreciated experiencing a sense of community among peers and called for enhancing collaboration and cooperation among students in class.

Our results in some ways point to the role and meaning of both peers and the on-site facilitator in the physical classroom. The on-site facilitator holds an important role in bridging challenges, which should promote students' learning and facilitate the teacher's navigation in the digital classroom, choice of teaching methods, and so on. The on-site facilitator's work and support close to the students in the classroom enables students to feel a greater sense of belonging and connectedness in class, which aligns with previous research highlighting the importance of structures and support aimed at strengthening K–12 students' sense of community for increased learning and satisfaction (Borup et al., 2019; Borup et al., 2014; Cavanaugh et al., 2009; Ilomäki & Lakkala, 2020).

Through synchronous remote teaching, digital and pedagogical changes take place that influence how both teachers and student' access, create, organize, and add knowledge. The roles of teachers and students are redefined because of affordances and constraints that come with the introduction of new digital technologies. Part of the teacher's mission is to create learning

environments that enhance students' feelings of relatedness and learning autonomy—something that seems to be even harder to create in an online environment due to lack of direct social interaction.

CONCLUSION

In this study, we set out to explore K–12 students' perceptions of synchronous remote teaching and learning. Although this was a small pilot study, it gives an indication of the possibilities and challenges students might experience in the synchronous remote teaching environment. The study provides knowledge about the importance of understanding the format from both a teacher and student perspective. It becomes important to understand how the learning environment changes and thus how the conditions for learning change. Teachers must be made aware of how they can overcome difficulties in overseeing students' distance learning processes, and students need possibilities to learn and become familiar with the new learning environment. A clearer interaction between teacher- and student-centered approaches in the remote teaching format is needed to make students more involved in their learning and at the same time make it easier for teachers to guide students' learning in the desired direction through their teaching choices. Students in turn need to gain knowledge about and be guided in how to navigate and become more involved in a remote teaching environment and how this in turn can affect their individual learning processes.

In conclusion, it is important to remember that even if there are obstacles, there are also many possibilities with this format, where different technical solutions and routines can be helpful only if knowledge of the context's significance for design and outcomes exists and is highlighted. Students feel that the format benefits their sense of participation and cooperation in the group. With that said, it is necessary to rethink and reconstruct the forms of teaching and learning in other ways than the traditional ones to better benefit and match the digital learning and teaching arena for both teachers and students.

There are, of course, limitations to this study, including the small sample, few statements included in the instrument, and lack of insight into the role of the on-site facilitator. Future studies should focus the role of the on-site facilitator, include larger samples, and conduct more advanced quantitative analysis on an increased number of statements about students' experiences of the synchronous remote learning environment.

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