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Teachers' use of motivational strategies in the synchronous online environment: A self-determination theory perspective

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Abstract
With the development of synchronous videoconferencing technology, research on the professional practices of synchronous online teaching has been growing at an exponential rate. However, little is known about synchronous online teachers' use of motivational strategies, despite the important role of teachers in fostering student motivation. To address this gap, this mixed-methods study examined how synchronous online teachers utilized motivational strategies and explored the influence of the synchronous online environment on the use of motivational strategies. As an analytical framework, we drew on the need-supportive teaching principles of the self-determination theory, which present three types of motivational strategies: involvement, structure, and autonomy-support. The quantitative analysis of survey results collected from language teachers ($N=72$) revealed the perception that autonomy-support and structure were relatively well suited to the online environment while involvement was difficult to implement. The qualitative analysis of follow-up interviews ($N=10$) elucidated how the online environment influenced the teachers' use of each strategy while producing a new framework and specific strategy lists that may be applicable to synchronous online teaching. This study presents important theoretical implications regarding the application of self-determination theory in online education, while also providing practical implications for synchronous online teacher preparation and professional development.

Keywords Self-determination theory · Motivational strategy · Synchronous online learning · Online language learning

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1 Introduction

Methods for how teachers can effectively support and maintain student motivation in the classroom have been a central topic in education research (Liu & Oga-Baldwin, 2022; Ryan & Deci, 2020). Self-determination theory (SDT), a macro-theory of human motivation, has been widely adopted by educational scholars because it provides a framework for analyzing teachers' motivational styles (Cheon et al., 2020; Hornstra et al., 2021). Particularly, based on the assumption that students have the three innate psychological needs of autonomy, competence, and relatedness, the theory recommends that teachers employ strategies that support the satisfaction of these needs in order to enable students to gain motivational benefits (Chiu, 2021; Hsu et al., 2019). Building on this theoretical backdrop, SDT researchers, especially in the field of language learning, have provided empirical evidence and developed informed teaching practices as to how teachers can become more motivating (Liu & Oga-Baldwin, 2022; Oga-Baldwin et al., 2017).

Meanwhile, with the outbreak of COVID-19 and the rapid advancement of videoconferencing technology, synchronous online teaching has now been positioned as a common practice across various disciplines, including language education (Jeon et al., 2022; Moorhouse et al., 2022). Reflecting on this trend, scholars have explored this environment to find its benefits and limitations for teaching and learning (Bailey et al., 2021; Kohnke & Moorhouse, 2022). For example, the synchronous online environment makes it possible for teachers and students to use different digital affordances that are supportive of educational activities but that do not present in offline classrooms (Jeon et al., 2022). In contrast, the absence of gestures, body language, and shared physical experience undermines a sense of community and personal connections (Butz & Strupnisky, 2017).

Noting the environmental differences, researchers have examined what particular competences and strategies are required of teachers for effective synchronous online teaching (e.g., Ashton, 2022; Belt & Lowenthal, 2022; Jeon et al., 2022). For example, Wang et al. (2022) found that frequently interacting with students by using different remote lecturing skills is one of the most important strategies for teachers to engage students in synchronous online learning. Phelps and Vlachopoulos (2020) developed competency guidelines for entry-level synchronous online teachers, considering the unique features available in the digital environment. In addition, Moorhouse and colleagues (2021, 2022) conceptualized e-classroom interactional competences (e-CIC) as particular competences required to facilitate learning in the synchronous online environment. All these efforts indicate a need for teachers to rethink their current methods of instruction and adopt different strategies than those employed in face-to-face contexts.

Although the previous studies provided insights into teaching competences and strategies that are generally required of online synchronous teachers, there remains one important gap in the literature: motivational strategies in the synchronous online environment have been largely underexplored, despite the important role of teachers in fostering student motivation (Grammens et al., 2022;

Reeve, 2006). To be specific, research on teachers' motivating styles to date has been undertaken almost entirely in face-to-face classrooms (e.g., Cheon et al., 2020; Reeve & Jang, 2006) and in a few cases, asynchronous online or blended settings (e.g., Chiu, 2021; Hsu et al., 2019). Given the previous evidence indicating that teachers require particular strategies appropriate for synchronous online teaching, we can assume that teachers may also need to employ strategies to motivate students in the synchronous online environment different from ones used in other settings, such as face-to-face or blended environments.

Therefore, using SDT as a guiding framework, this study aims to explore how motivational strategies are utilized by teachers. It also seeks to identify specific strategies that teachers employ in the synchronous online environment while exploring how the synchronous online setting influences the use of the strategies. This may help us better understand the complex nature of the synchronous online environment and teachers' use of motivational strategies within that environment, providing specific implications for synchronous online teacher preparation and professional development. In the following paper, we first introduce some background studies relevant to motivational strategies. We then describe the methodology used for the study, the findings of our inquiry, and then conclude with theoretical and practical implications derived from the findings.

2 Literature review

2.1 Self-determination theory and motivational strategies

According to SDT, individuals become more intrinsically motivated to achieve their personal goals when the three innate psychological needs of autonomy, competence, and relatedness are met in a given environment (Ryan & Deci, 2020): autonomy refers to an individual's willingness and volition regarding his or her behavior, competence indicates the feeling of effectiveness when an individual interacts with the environment, and relatedness is related to a sense of belonging (Ryan & Deci, 2020). That is, hypothesizing that providing need-supportive environments is critical for an individual's optimal motivation and growth, SDT underscores the importance of having environments that satisfy each of the three psychological needs (Jeon, 2022). In the field of education, many researchers have used the theory as their research framework to examine the need-supportiveness of classroom environments where teaching and learning take place (Reeve & Jang, 2006). Particularly, among various factors consisting of classroom conditions, Reeve (2006) stated, "one crucial ingredient within the supportive quality of the classroom is the teacher's motivating style" (p. 1), as teachers play a central role in fostering student motivation in schools.

Skinner and Belmont (1993) suggested that teachers can make their classroom more need-supportive through the provision of autonomy-support, structure, and involvement: autonomy-support indicates the amount of freedom a child is given to choose his or her own behavior; structure refers to the amount of information on how to effectively achieve desired outcomes; involvement refers to the quality of

Table 1 Features of need-supportive teachers (adapted from Skinner and Belmont (1993))

Involvement	Structure	Autonomy-support
• taking time for students • expressing affection toward students • enjoying interactions with students • being attuned to students • dedicating resources to students	• clearly communicating their expectations • responding consistently • offering instrumental help and support • adjusting teaching strategies to the level of the child	• allowing children latitude in their learning activities • providing connections between school activities and children's interests • not using external rewards, controls, and pressures

the interpersonal relationship between teachers and peers. Table 1 shows what each need-support dimension consists of specifically. Accordingly, teachers are encouraged to use the strategies in each dimension to facilitate the satisfaction of autonomy, competence, and relatedness in the classroom. Although having initially been developed for the face-to-face classroom (Skinner & Belmont, 1993), this categorization may work as a guide for discerning teachers' actual motivational strategies in online classrooms as well, given the three psychological needs are universal across environments (Ryan & Deci, 2020).

Similar to SDT-based research conducted on face-to-face classrooms, studies on online settings have also emphasized the role of teachers in creating online environments that meet the three psychological needs of students. For example, Hsu et al. (2019) explored the viability of SDT in the online context by examining whether need-support provided by teachers in asynchronous online courses enhances student motivation. They found a positive relationship between need-support and student motivation. However, they did not specify what instructional strategies the teachers utilized to support students' needs in the courses. Meanwhile, of more relevance to the current study, Chiu (2021) investigated whether the need-support provided digitally in a blended learning environment increased student engagement. Furthermore, he suggested how teachers can make online teaching more need-supportive by listing specific strategies divided into the three dimensions of autonomy-support, involvement, and structure (see Chiu, 2021, p. 3). In line with the results of Hsu et al. (2019), Chiu (2021) also confirmed the positive relationship between the provision of the three types of need-support and enhanced student engagement, thus emphasizing the role of teachers in preparing technology-based need-support. Overall, these online-based SDT studies, with a particular focus on the role of teachers, have yielded similar findings to prior studies conducted in face-to-face classrooms, therefore extending the core concept of SDT into the online environment.

Although this line of inquiry enriches our understanding of teachers' motivational role in online education, the literature has not covered all forms of online education, leaving one mode of online education understudied – online synchronous teaching through videoconferencing, an emergent and so far, underexplored form of online education (Grammens et al., 2022). As the affordances and constraints of synchronous online environments differ substantially from those of other educational settings (Moorhouse et al, 2022; Wang et al., 2022), different instructional approaches, including different motivational strategies, may be required for the effective implementation of synchronous teaching. Following is a brief overview of the affordances of synchronous online settings, with a particular focus on a teacher's role in language learning.

2.2 Synchronous online environments for language teaching

Teachers and students can overcome distance barriers and attend classes by utilizing conferencing platforms, such as Zoom, which include webcam capabilities that provide visual modalities and facilitate user interaction (Händel et al., 2022). As Kohnke and Moorhouse (2022) noted, these platforms have significantly

increased their relevance in language teaching by adding interactive features, such as chat boxes, breakout rooms, screen and file sharing, gesture buttons, annotations, and polling. However, Grammens et al. (2022) stated, "the large amount of options may be overwhelming and teachers need to be able to make informed decisions on which of the ample opportunities for interacting they choose or combine for which specific purpose" (p. 12). Given these technological features that uniquely shape the online teaching experience (Jeon et al., 2022), we can assume that teachers may need to adopt different approaches to teaching in the synchronous online environment, including motivational strategies.

Accordingly, considering the environmental differences, research has attempted to provide lists of teacher competences for language teaching through videoconferencing technology. For example, after surveying 75 university-level English teachers who conducted synchronous online teaching, Moorhouse et al. (2021) presented three sets of competences required of synchronous online teachers: technological, online environment management, and online teacher interactional. Similarly, pointing out that synchronous online teaching requires teachers to plan more meticulously than in face-to-face settings, Guichon (2010) suggested that language teachers assume multi-layered responsibilities comprised of pedagogical skills, socio-affective skills, and multi-media skills. However, as noted by recent review work on the role of teachers in the synchronous online setting (Grammens et al., 2022), among the teacher competences explored so far, particularly from the instructional perspective, how effectively teachers can motivate students in the environment has not received as sufficient attention as other competences.

Meanwhile, although not directly relevant to the use of motivational strategies, previous research on the use of videoconferencing technology for language learning has illustrated the possibility of teachers using affordances of the synchronous online environment to increase student motivation. For instance, it has been shown that teachers' appropriate use of webcams can foster students' sense of social presence and thus increase their participation in language class (Kozar, 2016); that allowing students to participate via typing, gestures, or emojis can ensure active engagement, including by learners with high L2 speaking anxiety (Cheung, 2021); that creating additional online spaces enables groups of students to have self-directed L2 interaction practice in a more engaging manner (Lenkaitis, 2020); and that using virtual backgrounds can help create an immersive learning environment (Kohnke & Moorhouse, 2022).

Despite these motivational affordances that can be introduced to the synchronous online classroom, research on how teachers can motivate students in that environment is significantly lacking. With the educational use of synchronous online delivery growing rapidly (Grammens et al., 2022), this dearth in research is especially problematic as motivation affects many critical learning outcomes (Ryan & Deci, 2020). Thus, to address these research gaps and considering that our understanding of motivational strategies for synchronous online teaching is in its early stages of development, this exploratory study sought to understand the degree to which teachers use and combine autonomy-support, structure, and involvement in the synchronous online environment. It also aimed to identify specific motivational strategies that are applicable to that environment,

while examining how the synchronous online environment influences the use of motivational strategies. The following research questions (RQs) guided this study.

1. To what extent do language teachers use each of the three motivational strategies (involvement, structure, and autonomy-support) in the synchronous online teaching environment?
2. What are the specific motivating strategies that teachers use and how does the online environment influence the use of each motivational strategy dimension?

3 Methodology

This study adopted a two-stage sequential mixed-methods design (Creswell, 2008): the authors adopted a quantitative method in the first stage, followed by qualitative data collection and analysis. In this way, the qualitative data were used to explain the results from the quantitative data analysis. This exploratory, sequential aspect of the design allowed the authors to gain a more holistic, complete understanding of teachers' use of motivational strategies in the synchronous online context and provided reliability and validity of the findings through data triangulation (Johnson & Onwuegbuzie, 2004).

3.1 Participants

Seventy-two English teachers from different elementary schools in South Korea were recruited through purposeful sampling: we invited elementary school teachers with experience in synchronous online teaching to complete a questionnaire by disseminating a link to the questionnaire through a social online forum for elementary school teachers in South Korea. The participants all had experience in teaching English as a Foreign Language (EFL) in the synchronous online environment for at least four months. At the time of the research, the teachers were working at public schools with a range of teaching experience – 0–5 years (13%), 6–10 years (53%), 11–15 years (34%) – all of whom taught elementary-level classes mostly consisting of students with beginner English proficiency. All teachers completed the questionnaire and then, 10 teachers were further invited to attend follow-up semi-structured interviews. Among teachers who voluntarily expressed interest in joining the interviews through the survey, we selected teachers to ensure a variety of ages, gender, and both general and synchronous online teaching experience. Table 2 provides the interview participants' details. At the start of the survey and interviews, we obtained the teachers' informed consent for participation: all teachers were informed of the research purpose and how their survey and interview responses would be handled in future publications.

3.2 Data collection

To address RQ1, regarding the general landscape of motivational strategies used by teachers in the synchronous online environment, we adapted the Teacher as Social Context Questionnaire (TSCQ) proposed by Wellborn et al (1988). Using SDT as

Table 2 Interview participant profiles

Teacher	Age	Gender	Number of synchronous online lessons implemented	Duration of synchronous online teaching (month)
1	28	Female	More than 350	About 4
2	32	Female	More than 420	About 5
3	35	Male	More than 700	About 12
4	39	Female	More than 640	About 12
5	29	Female	More than 560	About 8
6	41	Female	More than 450	About 6
7	38	Female	More than 560	About 8
8	37	Female	More than 400	About 5
9	43	Male	More than 400	About 5
10	34	Male	More than 480	About 6

a theoretical background, Wellborn and colleagues developed the TSCQ for assessing teachers' motivational strategies; this questionnaire has been widely adopted and validated for many years through previous SDT-based literature (e.g., Iglesias-García et al., 2020). The questionnaire comprises 41 items divided into the three dimensions of motivational strategies of involvement, structure, and autonomy-support, with a 4-point Likert scale ranging from "strongly disagree" to "strongly agree." Internal reliability was calculated to determine whether any of the items needed to be excluded in light of the current research context. Four items for involvement, three items for structure, and two items for autonomy-support were excluded. As a result, 10 items for involvement (Appendix A), 12 items for structure (Appendix B), and 10 items for autonomy-support (Appendix C) were used for further analysis. Alpha levels for each dimension were confirmed to be 0.83, 0.72, and 0.86, respectively, which indicated that the revised questionnaire was highly reliable (Tuckman, 1999).

Given the exploratory nature of the study, quantitative data collected from the questionnaire were analyzed following standard statistical procedures to produce descriptive statistics including percentages and frequencies (Jeon et al., 2022). Based on the descriptive statistics, we also conducted content-analysis of the questionnaire responses to provide further insight. The entire process of analysis in this stage was to provide a general, holistic understanding of the participant teachers' use of motivational strategies. Before performing the statistical analysis, negatively worded items were reverse-coded and descriptive statistics were worked out using the software Jamovi.

Next, semi-structured interviews were administered individually to answer RQ2, which addressed the identification of specific motivational strategies and the influence of the synchronous online environment on teachers' use of the strategies. The first author conducted the interviews with each participant through Zoom at a time of their choice. At the start of each interview, the interviewer provided a brief outline of the study and explained his interest in motivation and

online teaching, while all participants were invited to ask questions prior to providing informed consent that included permission to audio-record each interview and to use responses for research.

To prepare interviews, semi-structured interview protocols (see Appendix D for the interview outline) were developed based on protocols used by Taylor et al. (2009) who examined teachers' use of motivational strategies in face-to-face teaching. We considered both theoretical and practical aspects of the framework based on relevant work in the fields of SDT (e.g., Deci & Ryan, 2000; Hornstra et al., 2021; Jeon, 2022) and synchronous online education (e.g., Belt & Lowenthal, 2022; Moorhouse et al., 2022; Phelps & Vlachopoulos, 2020; Wang et al., 2022) to finalize the protocols. These interview protocols were utilized to provide a framework for the interaction between the researcher and each teacher, helping the researcher remain both flexible and attentive to emergent issues. The initial questions were aimed at exploring the general perceptions and experiences of teachers in the synchronous environment. Next, follow-up questions were asked about teachers' use of specific motivational strategies, while also focusing on the influence of the synchronous online environment on their choice and use of the motivational strategies. The interviews for each teacher lasted from 42 to 62 min. All interviews were then transcribed verbatim with excerpts translated into English for further analysis.

Next, the transcripts of the interview data were qualitatively analyzed to discover repeated patterns of meaning in relation to RQ2 (Braun & Clarke, 2006). First, each author recursively read the transcribed data to gain a general understanding. Then, specific motivational strategies and relevant parts to the underlying reasons for the teachers' motivational strategies were extracted for coding. Then, codes sharing a similar meaning were colligated into common themes. During the entire process, researchers considered the link between the three dimensions of motivational strategies and the technological affordances of synchronous teaching. The individual analysis of each researcher was compared, and disagreements were resolved through several rounds of discussions. For the last step, the researchers refined and finalized the themes to answer RQ2 using the reconciled coding.

The two main themes generated were related to the influence of the synchronous online environment on the use of motivational strategies: *environments disadvantageous to conducting involvement strategies* and *more active use of autonomy-support and structure strategies to supplement inadequate use of involvement strategies*. In addition, the sub-themes focused on exemplifying specific motivational strategies that the teachers employed according to each strategy category. How and why the teachers selected and used each strategy was also analyzed. Finally, representative answers were extracted as a method of documenting repeated patterns of meaning behind the teachers' words. The entire data analysis process was triangulated by both cross-checking the two different sets of data (i.e., survey and interview) and cross-checking the data between the researchers, ensuring the credibility and trustworthiness of the findings (Braun & Clarke, 2006; Creswell, 2008).

4 Results and discussion

4.1 Overall use of motivational strategies in the synchronous online environment

Figure 1 displays self-reports of the teachers' overall use of motivational strategies in the study. In the synchronous online environment, the teachers perceived that involvement strategies ($M = 2.35$, $SD = 0.84$) could be utilized relatively less than the other two strategies of structure ($M = 2.81$, $SD = 1.01$) and autonomy-support ($M = 2.99$, $SD = 0.87$). In other words, the teachers shared that providing support to enhance students' need for relatedness was relatively limited and difficult to implement in the synchronous online setting, compared to providing support for enhancing students' needs for competence and autonomy.

Content-analysis of the questionnaire responses provided more detailed information about how the teachers perceived their use of motivational strategies. Regarding involvement (Appendix A), most of the items received a score of less than 2.5 out of 4, which indicated inactive or limited use of involvement strategies by the teachers. The items that scored lower than 2.5 were related to the lack of teachers' social presence. For example, the teachers perceived that they could not "always be available to the students" (Item 4), that they did not "spend time with the students" (Item 5), more importantly, they felt that the students were not "easy to like" (Items 7 and 9) and that students could not "count on them to be there for them" (Item 10).

Compared to involvement strategies, the teachers showed relatively more positive perceptions of using structure and autonomy-support strategies. Regarding structure (Appendix B), scores for items about communicating teachers' expectations of students (Items 1, 4, and 7) and items about explaining content in understandable ways (Items 2 and 6) obtained a greater score than 3, while scores for items about getting information regarding student performance (Items 8, 9, and 10) were around 2.5.

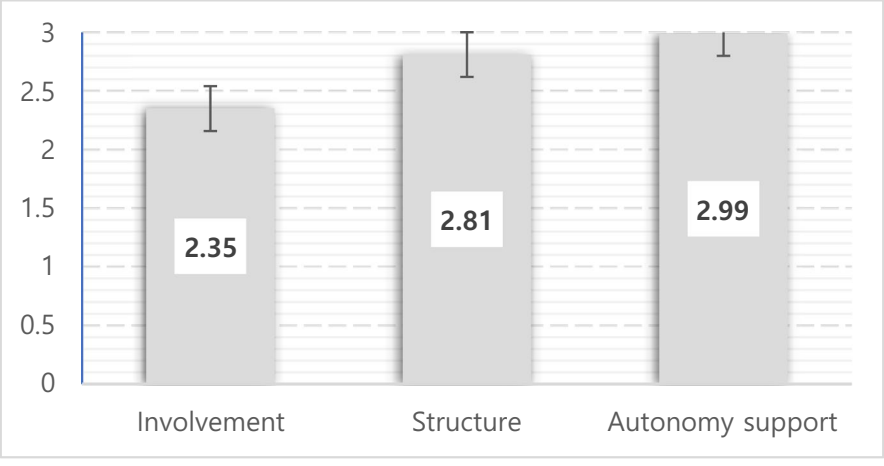

Fig. 1 Teachers' self-reports of motivational strategy use

As for autonomy-support (Appendix C), five items out of 10 scored more than 3 points each. Specifically, scores for items about providing detailed instruction (Items 1 and 2) were around 3.5, and items on explaining the relevance or usefulness of learning English obtained greater than 3 points (Items 3 and 4). Items regarding giving choices (Items 6, 7, 8, 9, and 10) scored relatively less than other items; but aside from Item 10 ($M = 2.09$), these items also obtained scores over the medium score of 2.5.

In sum, the questionnaire results revealed the perception that autonomy-support and structure were relatively well suited to the online environment while involvement was difficult to implement.

4.2 The influence of the synchronous online environment on teachers' use of motivational strategies

Further exploration was implemented through in-depth interviews with 10 teachers to elucidate the quantitative findings. The interviews were focused on how the synchronous online environment influenced the teachers' use of each strategy dimension and on identifying a specific list of strategies that they employed. Figure 2 shows a framework of motivational strategies for synchronous online teaching. While technological affordances, social presence, and offline pedagogies dynamically influenced the teachers' use of the motivational strategies, it is of note that, using technological affordances provided in the environment, the teachers implemented involvement strategies to create a social presence that had been

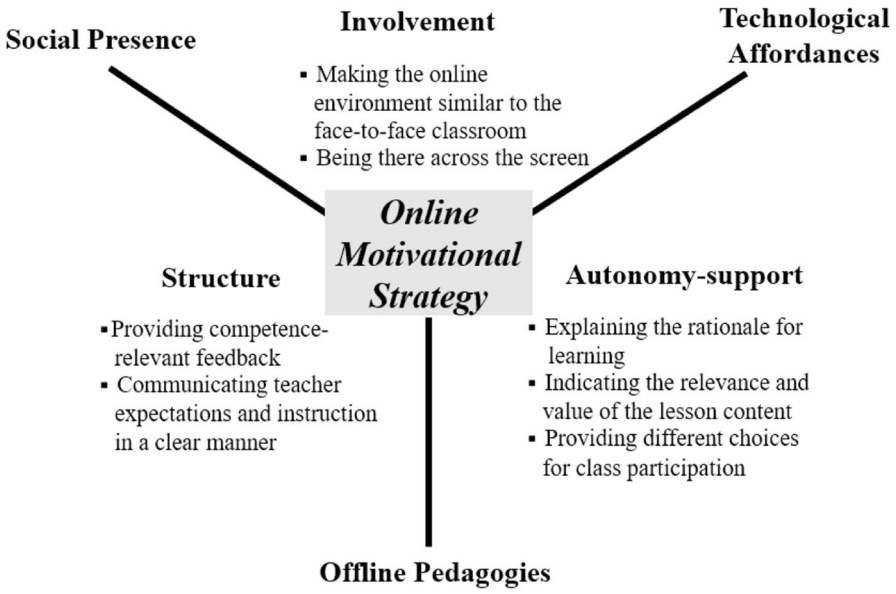

Fig. 2 A framework of motivational strategies for synchronous online teaching

naturally formed in face-to-face classrooms but that lacked in the online classroom, whereas autonomy-support and structure strategies were implemented in a way to enhance the teachers' pedagogies for offline teaching.

4.2.1 Theme 1. Environments disadvantageous to conducting involvement strategies

Table 3 offers a list of involvement strategies that the participant teachers employed. All participant teachers mentioned that keeping their webcams and microphones always on was important teacher behavior in the online context, both as an important strategy itself and as a starting point for implementing other involvement strategies. They underscored the importance of this behavior by stating that it provided students with a sense of teacher presence in the online classroom. The teachers stated that, unlike the face-to-face classroom, where the social presence of teachers was naturally created, they had to effortfully create a sense of presence in the online environment.

> *In the offline classroom, we don't need to try to give students a feeling that we are there with them. However, in Zoom classes, we must try to provide the feeling that we teachers are always there. In this sense, teachers must always keep their webcams and mics on at all times and in any situation.* (Teacher 1)

Teacher 2 further mentioned that the reason for the need to consistently use the webcam and microphone was that it acted as a basis for teachers to use more active gestures and reactions to students' utterances which helped to sustain student motivation.

> *In Zoom classes, as you know, we are not physically present, and this negatively impacts student motivation in class. To alleviate this, I need to signal to students that I am always there. That's why I always tried to use big gestures and responded to almost all utterances students made by at least saying "A-ha," "Okay, keep going," etc.* (Teacher 2)

In addition to the strategies related to social presence of teachers, nine teachers utilized more activity-like involvement strategies to build rapport in class. For example, compared to their behavior in the face-to-face environment, the

Table 3 Online involvement strategies

■ Making the online environment similar to the face-to-face classroom
• Keeping a teacher's webcam and microphone always switched on
• Administering a 'webcam-on' classroom rule
• Implementing more extended small talk before and after a lesson
• Ensuring affinity time and place among students
■ Being there across the screen
• Engaging students in their physical surroundings through the webcams
• Using big gestures and active backchannelling

teachers felt a need to conduct more small talk activities before and after presenting lesson content to create a feeling of relatedness among students. Teacher 4 elaborated on this aspect:

> *I always started my Zoom class by asking about their feelings, the weather, their health conditions, and their plans for the weekend. By sharing this short but warm moment, we can laugh and start the class much more comfortably.* (Teacher 4)

As with teachers' use of webcams, the use of webcams by students was perceived to be necessary since this also provided a basis for teachers to implement other involvement strategies. All teachers mentioned that they encouraged students to keep their webcams always switched on during the entire class. Based on their webcam use and use of the breakout room function, eight teachers specifically mentioned that they provided an affinity place and time where students could talk about their daily life with one another.

In particular, six teachers perceived that daily conversation activities could be implemented more interestingly in the online environment, given that students attended classes outside school. In other words, the teachers were able to engage students in new physical surroundings, which had not been possible in face-to-face classrooms. Teacher 9 stated:

> *Zoom classes sometimes are a better place for talking about daily topics. Students attend class from their homes, so we can talk about their personal belongings and situation in a more authentic way. One day, I found that students were talking about animals by showing their pets through the webcams. Using their home environments as a topic for talking is one of the benefits we can have from having Zoom English classes.* (Teacher 9)

Even though all teachers agreed that a certain degree of social presence can be maintained between students and teachers and that rapport building was also possible in the online environment, there were clear limits to conducting involvement when compared to the face-to-face setting. All teachers stated that only a certain, limited number of strategies were possible as a way to build rapport, agreeing that nothing could help teachers perfectly produce a similar amount of social presence in the online environment as they are able to in the face-to-face environment. This is due to the technological features inherent in the synchronous online environment, such as the limited view of webcams that reveals only a part of a participant's visage and the ease at which students can decide not to be present visually or verbally via webcam or mic. All teachers mentioned that the synchronous online environment was inherently set to deteriorate the feelings of relatedness. Teacher 7 elaborated her opinion on this issue as follows:

> *Students could easily choose not to participate by turning off their webcams and mics from moment to moment. Everything I took for granted in offline classes now became what I had to put my effort into.* (Teacher 7)

4.2.2 Theme 2. More active use of autonomy-support and structure strategies to supplement inadequate use of involvement strategies

In line with the quantitative findings, interviewee teachers revealed their belief that the synchronous online environment was relatively more suited to autonomy-support and structure strategies than involvement strategies. They thought that they had to conduct a more systematic implementation of autonomy-support and structure strategies to address possible issues that might have resulted from the lack of social presence. As for this aspect, Teacher 6 stated,

> *In the face-to-face classroom, we can rely on established rapport to engage students; however, we are far from one another in the online space so we couldn't do this anymore. That's why I tried to prepare online classes more systematically than in the offline setting.* (Teacher 6)

In contrast to strategies for creating social presence, a concept that had been taken for granted previously but had become significantly diminished in the online setting, the teachers believed that they could use autonomy-support and structure strategies in a way that enhanced their existing pedagogy in the face-to-face classroom. That is, their use of autonomy-support and structure strategies was facilitated by technological affordances that were characteristic of the online environment, and in this sense, the environment was perceived as advantageous for those strategies.

4.2.3 Theme 2.1. Structure strategies

Table 4 shows a list of structure strategies that the participant teachers employed. The teachers indicated that planning and conducting more structure strategies was necessary to initiate and sustain student motivation in the synchronous online setting. As teachers planned student-centered activities, structure strategies became more important because without them the class could easily become chaotic. For this issue, Teacher 4 mentioned:

> *I found that as more interactive the class became, the more difficult it was to manage the class well. Teachers should take additional steps to successfully manage group activities in the online environment.* (Teacher 4)

Table 4 Online structure strategies

■ Providing competence-relevant feedback
• Monitoring student performance through collaborative websites in breakout rooms
• Checking student understanding through emoji and chat functions
• Collecting performance-based evidence for assessment through digital tools
■ Communicating teacher expectations and instruction in a clear manner
• Setting detailed rules for classroom behavior
• Providing visual aids along with spoken instruction

For this, nine teachers underscored the importance of communicating their expectations to the class and explaining rules in a detailed and organized manner. As Teacher 10 mentioned, these types of careful instruction were especially needed when teachers used the breakout room function, where students had their own interactive space while being virtually far away from other peer groups and the teacher's control.

> *When I first used the [the breakout room] function, I simply prepared an interaction activity and said, "Let's do it!" After, I found that many groups were not doing their task. … I asked for the reason and some students said, "we didn't know what to do." I should have provided more detailed, step-by-step instructions because students didn't have me or even other peer groups around to follow.* (Teacher 10)

They also noticed that some functions in the synchronous online environment, such as the use of collaborative websites, chat response functions, and other gamified platforms, could supplement their teaching practices, particularly for the purpose of monitoring and assessing student performance. They perceived these affordances to be even more supportive of students' competence satisfaction than in the face-to-face classroom. For example, to provide competence-relevant feedback, Teacher 5 used interactive websites (e.g., Google Slide) along with breakout rooms and assigned each group to work on a specific slide number. In this way, the teacher monitored student performance, while visiting breakout groups to give feedback.

> *I could monitor student performance at the same time using Google Slides. The app enabled me to obtain specific information about what students were doing. Therefore, I could give more specific feedback about their performance.* (Teacher 5)

In addition, students were encouraged to use chat or emoji functions when responding to the teacher. Nine teachers mentioned that by allowing for different modes of communication, they were able to ensure more active participation by students. For example, Teacher 3 noticed that the textual mode could allow students to respond simultaneously, thus helping to create an active learning atmosphere.

> *The audio system in Zoom classes does not allow multiple students to speak at the same time. Also, some students' textual answers can work as models for peers, sometimes sparking others' responses further; thus, it helps to create a learning atmosphere.* (Teacher 3)

Another area that teachers considered to be particularly more suited to the online setting was formative assessment. That is, compared to the face-to-face classroom where teachers had to record processes and outcomes of student performance, what they performed in the online space was digitalized and automatically recorded, which enabled teachers to be able to easily collect evidence for assessment. For example, Teacher 8 said:

I could have a great deal of information about student performance, such as students' chat history, audio recording files from Zoom, how many questions students got right in Kahoot! and so on. These materials helped me prepare and provide more detailed feedback to students. (Teacher 8)

4.2.4 Theme 2.1. Autonomy-support strategies

Table 5 is a list of autonomy-support strategies that the participant teachers utilized. Regarding autonomy-support, teachers first noted that they shared an online space where English is used as a medium of communication among users around the world. In this regard, all participants indicated that some strategies, such as explaining rationales for learning the language and indicating the value of language learning, were able to be conducted in a more convenient, meaningful manner. For example, by screen-sharing websites, Teacher 1 demonstrated how English was used as a communication tool among different people from various countries:

I sometimes showed how we could use the language in cyberspace to communicate with other people, such as by making or reading comments about their favorite singers or online games. (Teacher 1)

Some teachers further stated that they indicated the value and relevance of their language lesson by specifically demonstrating how the lesson could be applied in real-life situations online. Teacher 10 introduced one of her strategies as follows:

When teaching "clothes", I showed how to search and order clothes on Amazon. Students seemed to be very interested in the demonstration. This type of activity could be done much more easily and in a much more authentic way in the online classroom. (Teacher 10)

Six teachers considered that in the synchronous online environment, they could provide students with more self-directed learning opportunities. Teacher 3 specifically mentioned, "I could let individual students use the online space where they could search, select, and apply information regarding class content." Furthermore, all teachers also underscored the importance of allowing students to use different response choices such as emoji, written, verbal, gesture, and drawing options. The teachers stated that by allowing students to use these options, they could foster

Table 5 Online autonomy-support strategies

- ■ Explaining the rationale for learning
  - • Showing how English is used as a communication tool on the Internet
- ■ Indicating the relevance and value of the lesson content
  - • Demonstrating how lesson content is applied to the online space
- ■ Providing different choices for class participation
  - • Allowing various response options (emoji, written, verbal, gesture, drawing)
  - • Providing an opportunity for self-directed learning with internet search options

student motivation. Teacher 2 elaborated on this aspect, sharing a story about one student.

> *I was surprised to find that one student was very silent in the face-to-face classroom, but he had been very active in the online classroom. He really participated well by using typing to communicate with me in the Zoom classes.* (Teacher 2)

Overall, the specific manifestation of each motivational strategy was affected and determined by the affordances that were characteristic of the synchronous online environment (Grammens et al., 2022; Händel et al., 2022; Moorhouse et al., 2022). For example, to build rapport in the classroom, Teacher 9 used a webcam to engage his students in their physical surroundings. To provide different response options, Teacher 2 introduced different communication modes of the interactive features available in the videoconferencing platform. To provide competence-relevant feedback, Teacher 3 familiarized herself with using different gamified platforms and was able to collect students' performance data. In other words, the motivational strategies appeared differently in online teaching than in the traditional classroom in relation to the affordances of the online environment. These results support the argument put forth by researchers in the previous literature that online teaching requires teachers to possess particularly different knowledge, attitudes, and competences from those needed in the face-to-face classroom (Grammense et al., 2022; Moorhouse et al., 2022).

Meanwhile, the interview data confirmed the perception identified in the survey that fostering a sense of relatedness is difficult to implement in the synchronous teaching environment. This result is supported by empirical research that described teachers' difficulties in eliciting students' emotional engagement in the synchronous environment (Ashton, 2022; Cheung, 2021). Also, we identified how the environment influenced the teachers' use of each category of strategies. The teachers felt that in the synchronous online environment, they had to strive to create a social presence that had been naturally guaranteed in face-to-face classrooms. In contrast, the teachers utilized different technological affordances in ways that enhanced the pedagogies that they used or valued in face-to-face teaching (Jeon et al., 2022).

5 Limitations

This research is not without its limitations. First, this study examined only a small number of teachers working as English teachers in elementary-level schools located in one country; therefore, the findings may not be broadly generalizable to other contexts. Future research should examine teachers from a diverse range of subjects, school levels, and countries for further theorizing and empirical examination of teachers' motivational strategies in the context of synchronous online teaching. Second, this study employed a survey and interviews to examine teachers' use of motivational strategies. Given the exploratory nature of the study, the

use of the research tools might be appropriate; however, they are limited by their self-reporting nature. In this regard, it may be an important avenue for future research to collect data on teachers' actual use of motivational strategies through observation. This will help us to have a more complete and contextualized understanding of the use of motivational strategies. Last, this study did not provide any data regarding students. An important and interesting contrast to this study will be the examination of teachers' use of motivational strategies from the student perspective. For example, it may be possible to qualitatively analyze how students perceive teachers' use of motivational strategies in the synchronous online setting or to quantitatively examine the degree to which strategies in each category facilitate student motivation.

6 Implications and conclusion

Despite the limitations mentioned above, this study presents several theoretical implications for the use of SDT in online education, while also providing practical implications for synchronous online teacher preparation and professional development. Regarding the theoretical implications, first, the findings of this study demonstrate the value of SDT in identifying room for improvement in online teaching settings, providing strong support for the continued use of the theory in future research on online education (Jeon, 2022; Ryan & Deci, 2020). Particularly, based on the SDT framework (Skinner & Belmont, 1993), the researchers revealed that teachers perceive the adoption of involvement strategies in synchronous online lessons as constrained and the strategies of structure and autonomy-support as relatively well suited to the online environment.

Second, previous SDT-based research found that some contextual factors (e.g., teachers' perceptions of student motivation and institutional pressure on teacher performance) affect teachers' adoption of motivational strategies (Oga-Baldwin et al., 2017; Taylor et al., 2009). This study adds that the mode of education through which teaching and learning take place is also a key factor that influences and determines teachers' motivating styles. Specifically, as shown in Fig. 2, the context of online instruction and specific technological affordances provided in the environment led to participant teachers exhibiting an imbalanced profile of the three motivational strategy dimensions (Hornstra et al., 2021).

Last, the analysis of the interview data shows an interdependent relationship between the three motivational strategy dimensions (Hornstra et al., 2021). Specifically, the participant teachers perceived the use of involvement strategies in the synchronous online context as constrained; however, this perception led to them utilizing autonomy-support and structure strategies more intensively and systematically. For example, Teacher 6 was unable to rely on rapport to promote student motivation in the online setting, which contrasted with her face-to-face classroom experiences where she could use the shared sense of social presence as one method of motivating students. However, the results indicate that the teachers, including Teacher 6, did not succumb to the challenges that the lack of social

presence caused; rather, this issue motivated them to seek out other forms of support, namely autonomy-support and structure, to compensate for the deficiency.

The practical implications of this study are as follows. First, the current study provided specific lists of motivational strategies (see Tables 3, 4, and 5) that may act as an initial guide to enhance the three basic psychological needs of students in synchronous online contexts. For teacher educators, the lists can be used as a reference to improve their existing training courses for online teaching, while teachers themselves can use the lists to reflect on and improve their own online teaching practices. For example, teachers, who struggle with fostering a sense of competence in the online environment, may wish to compare their current online practices with the strategies listed in Table 4 to identify potential room for improvement.

Second, consistent with previous research (e.g., Jeon et al., 2022; Wang et al., 2022), this research showed that synchronous online environments themselves were not perfectly suited to fostering a sense of relatedness. Thus, the findings of the study confirmed the need for taking additional steps before and after a synchronous session to foster a sense of relatedness in addition to using the involvement strategies identified in the study during the synchronous online class. For example, as suggested by Ashton (2022), teachers might be able to provide more pastoral care and individual communication to students outside the classroom. Teachers can also use an asynchronous online forum focused on building social relationships (Butz & Strupnisky, 2017). Future research that explores different ways of enhancing the feeling of relatedness in the synchronous online space is worth investigating more.

Last, confirming the idea that synchronous online teaching requires specific teacher competences (e.g., Belt & Lowenthal, 2022; Choi et al., 2023), this study shows a need for teacher training courses specifically designed for synchronous online teaching. In response to the affordances and constraints provided by the digital environment (Jeon et al., 2022), we have observed that teachers reinforced or abandoned some of the motivational strategies that had been utilized in face-to-face classrooms while developing some new strategies appropriate for the digital environment. That is, the manifestation of the listed strategies was mediated by using the specific functions of a synchronous platform or different types of external software. However, it is of note that the technologies were used in ways that maximized the teachers' pedagogies. This indicates a need for training courses where teachers' pedagogies are thoroughly taken into account when addressing how to select and apply different technologies for synchronous online teaching.

To conclude, this research may serve as a starting point for examining the motivational strategies of teachers in the synchronous online setting. The investigation of the strategies is of significant importance because it provides a deeper understanding of why and how synchronous online teachers are not always successful in motivating their students. Greater understanding and awareness of teachers' experiences and perceptions, particularly in relation to the nature of the synchronous online environment, will assist teacher educators in particular and society in general for preparing how to help synchronous online teachers provide greater quality teaching.

Appendix A. Questionnaire results for involvement strategies

No	Items	*M*	*SD*
1	When the students of this class do not do as well as they can, I can make time to help them find ways to do better.	3.13	0.86
2	I talk with the students of this class.	2.53	0.97
3	I know the students of this class well.	2.38	0.92
4	I can't always be available to the students of this class.	2.38	0.67
5	I spend time with the students of this class.	2.28	0.77
6	I don't understand the students of this class very well.	2.21	0.61
7	The students of this class are difficult to like.	2.19	0.60
8	I know a lot about what goes on for the students of this class.	2.18	0.86
9	The students of this class are easy to like.	2.09	0.54
10	The students of this class can count on me to be there for them.	2.09	0.93

Appendix B. Questionnaire results for structure strategies

No	Items	*M*	*SD*
1	I try to be clear with the students of this class about what I expect of them in class.	3.59	0.67
2	When the students of this class don't understand something, I explain it in a lot of different ways.	3.59	0.50
3	I find it hard to be consistent with the students of this class.	3.35	0.75
4	I talk with the students of this class about my expectations for them.	3.35	0.66
5	When I discipline the students of this class, I always explain why.	3.21	1.06
6	I find it hard to teach the students in a way they can understand.	3.21	0.87
7	Sometimes I feel I don't make my expectations clear to the students of this class.	3.12	0.76
8	I can't tell when the students of this class are keeping up with me.	3.01	0.94
9	It's hard to know when the students of this class are ready to go on to new material.	2.42	0.88
10	I find it difficult to tell when the students of this class need help.	2.42	0.52
11	I let the students of this class get away with things I normally wouldn't allow.	2.41	0.78
12	I don't always have time to follow through with the students of this class.	1.95	1.15

Appendix C. Questionnaire results for autonomy-support strategies

No	Items	*M*	*SD*
1	I find myself telling the students of this class every step to make when it comes to schoolwork.	3.60	0.49
2	I have to lead the students of this class through their schoolwork step by step.	3.50	0.51
3	I encourage the students of this class to think about how schoolwork can be useful to them.	3.49	0.50
4	It is difficult to explain to the students of this class why what we do in school is important.	3.28	0.79
5	I can't let the students of this class do things their own way.	3.09	0.71
6	I let the students of this class make a lot of their own decisions regarding schoolwork.	2.79	0.75
7	I try to give the students of this class a lot of choices about classroom assignments.	2.78	0.76
8	My general approach with the students of this class is to give them as a few choices as possible.	2.69	0.78
9	I can't afford to let the students of this class decide too many things about schoolwork for themselves.	2.62	0.93
10	It's better not to give too many choices to the students of this class.	2.09	0.84

Appendix D. Interview outline

Guiding themes	• Motivational strategies that the teacher employed • Influence of the synchronous online environment on strategy use
Initial question topics	• Background information • General perception and experience of synchronous online teaching • Perception of student motivation in the synchronous online environment • Difficulties encountered during synchronous online teaching • Advantages of teaching in the synchronous online environment
Specific questions	• What are some strategies that you used to motivate students? • Did you use any strategies to foster students' sense of belonging? • Did you use any strategies to enhance students' feeling of competence? • Did you use any strategies to facilitate students' autonomy? • Can you give me specific examples of when you have used this strategy, and how did students respond? • Why did you choose to use this strategy? • Did you find using this strategy helpful when teaching in Zoom? • What difficulties did you have when using this strategy? • How did you overcome these difficulties?
Major themes	**Theme 1: Environments disadvantageous to conducting involvement strategies** Teachers felt that many resources that they effortlessly relied on to foster students' sense of belonging in the offline setting became unavailable in the online setting. They thought that they needed to effortfully plan and conduct involvement strategies to foster the feeling of relatedness in the online class. Despite their efforts, the strategies they deployed did not completely serve the purpose because of the limitations inherent in the online context. **Theme 2: More active use of autonomy-support and structure strategies to supplement inadequate use of involvement strategies** Teachers thought that technological affordances newly available in the online setting were supportive of their implementation of autonomy-support and structure strategies. In addition, the perceived limitation in implementing involvement strategies encouraged the teachers to seek more systematic use of autonomy-support and structure strategies to maintain the quality of teaching.

Data availability The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflicts of interest The authors declare that there is no conflict of interest.

References

Ashton, K. (2022). Language teacher agency in emergency online teaching. *System, 105*, 102713.

Bailey, D., Almusharraf, N., & Hatcher, R. (2021). Finding satisfaction: Intrinsic motivation for synchronous and asynchronous communication in the online language learning context. *Education and Information Technologies, 26*, 2563–2583. https://doi.org/10.1007/s10639-020-10369-z

Belt, E. S., & Lowenthal, P. R. (2022). Synchronous video-based communication and online learning: an exploration of instructors' perceptions and experiences. *Education and Information Technologies*. Advance online publication. https://doi.org/10.1007/s10639-022-11360-6

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Butz, N., & Strupnisky, R. (2017). Improving student relatedness through an online discussion intervention: The application of self-determination theory in synchronous hybrid programs. *Computers & Education, 114*, 117–138.

Cheon, S. H., Reeve, J., & Vansteenkiste, M. (2020). When teachers learn how to provide classroom structure in an autonomy-supportive way: Benefits to teachers and their students. *Teaching and Teacher Education, 90*, 103004.

Cheung, A. (2021). Synchronous online teaching, a blessing or a curse? Insights from EFL primary students' interaction during online English lessons. *System, 100*, 102566.

Chiu, T. K. F. (2021). Digital support for student engagement in blended learning based on self-determination theory. *Computers in Human Behavior, 124*, 106909.

Choi, S., Jang, Y., & Kim, H. (2023). Influence of pedagogical beliefs and perceived trust on teachers' acceptance of educational artificial intelligence tools. *International Journal of Human-Computer Interaction, 39*(4), 910–922. https://doi.org/10.1080/10447318.2022.2049145

Creswell, J. W. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative approaches to research* (3rd ed.). Merrill/Pearson Education.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Enquiry, 11*, 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Grammens, M., Voet, M., Vanderlinde, R., Declercq, L., & De Wever, B. (2022). A systematic review of teacher roles and competences for teaching synchronously online through videoconferencing technology. *Educational Research Review*, *37*, 100461. https://doi.org/10.1016/j.edurev.2022.100461

Guichon, N. (2010). Preparatory study for the design of a desktop videoconferencing platform for synchronous language teaching. *Computer Assisted Language Learning, 23*(2), 169–182.

Händel, M., Bedenlier, S., Kopp, B., Gläser-Zikuda, M., Kammerl, R., & Ziegler, A. (2022). The webcam and student engagement in synchronous online learning: visually or verbally?. *Education and Information Technologies*. Advance Online Publication. https://doi.org/10.1007/s10639-022-11050-3

Hornstra, L., Stroet, K., & Weijers, D. (2021). Profiles of teachers' need-support: How do autonomy support, structure, and involvement cohere and predict motivation and learning outcomes? *Teaching and Teacher Education, 99*(103257), 1–12.

Hsu, H. C. K., Wang, C. V., & Levesque-Bristol, C. (2019). Reexamining the impact of self-determination theory on learning outcomes in the online learning environment. *Education and Information Technologies, 24*(3), 2159–2174.

Iglesias-García, M. T., Maulana, R., Fernández-García, C. M., & García-Pérez, O. (2020). Teacher as social context (TASC) questionnaire in the Spanish setting: Teacher version. *Psicología Educativa, 26*(1), 17–26.

Jeon, J. (2022). Exploring a self-directed interactive app for informal EFL learning: a self-determination theory perspective. *Education and Information Technologies, 27*(4), 5767–5787. https://doi.org/10.1007/s10639-021-10839-y

Jeon, J., Lee, S., & Choe, H. (2022). Teacher agency in perceiving affordances and constraints of videoconferencing technology: Teaching primary school students online *System, 108*, 102829. https://doi.org/10.1016/j.system.2022.102829

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher, 33*(7), 14–26. https://doi.org/10.3102/0013189X03300701

Kohnke, L., & Moorhouse, B. L. (2022). Facilitating synchronous online language learning through Zoom. *RELC Journal, 53*(1), 296–301.

Kozar, O. (2016). Perceptions of webcam use by experienced online teachers and learners: A seeming disconnect between research and practice. *Computer Assisted Language Learning, 29*(4), 779–789.

Lenkaitis, C. A. (2020). Technology as a mediating tool: Videoconferencing, L2 learning, and learner autonomy. *Computer Assisted Language Learning, 33*(5–6), 483–509.

Liu, M., & Oga-Baldwin, W. L. Q. (2022). Motivational profiles of learners of multiple foreign languages: A self-determination theory perspective. *System, 106*, 102762.

Moorhouse, B. L., Li, Y., & Walsh, S. (2021). E-classroom interactional competencies: Mediating and assisting language learning during synchronous online lessons. *RELC Journal*. Advance online publication. https://doi.org/10.1177/0033688220985274

Moorhouse, B. L., Walsh, S., Li, Y., & Wong, L. L. C. (2022). Assisting and mediating interaction during synchronous online language lessons: Teachers' professional practices. *TESOL Quarterly*. Advance online publication. https://doi.org/10.1002/tesq.3144

Oga-Baldwin, W. L. Q., Nakata, Y., Parker, P., & Ryan, R. M. (2017). Motivating young language learners: A longitudinal model of self-determined motivation in elementary school foreign language classes. *Contemporary Educational Psychology, 49*, 140–150.

Phelps, A., & Vlachopoulos, D. (2020). Successful transition to synchronous learning environments in distance education: A research on entry-level synchronous facilitator competencies. *Education and Information Technologies, 25*, 1511–1527. https://doi.org/10.1007/s10639-019-09989-x

Reeve, J. (2006). Teachers as facilitators: What teachers do and why. *The Elementary School Journal, 106*(3), 225–236.

Reeve, J., & Jang, H. (2006). What teachers say and do to support students' autonomy during a learning activity. *Journal of Educational Psychology, 98*(1), 209–218.

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology, 61*(April), 101860.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85*(4), 571–581.

Taylor, I. M., Ntoumanis, N., & Smith, B. (2009). The social context as a determinant of teacher motivational strategies in physical education. *Psychology of Sport and Exercise, 10*(2), 235–242.

Tuckman, B. W. (1999). *Conducting educational research* (5th ed.). Thomson Learning.

Wang, Q., Wen, Y., & Quek, C. L. (2022). Engaging learners in synchronous online learning. *Education and Information Technologies*. Advance online publication. https://doi.org/10.1007/s10639-022-11393-x

Wellborn, J., Connell, J., Skinner, E. A., & Pierson, L. H. (1988). *Teacher as social context: A measure of teacher provision of involvement, structure and autonomy support* (Tech. Rep. No. 102). University of Rochester.

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