Teachers' use of online scaffolding strategies in a poly-synchronous grammar course: Effect and perception of Indonesian EFL students

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ABSTRACT

Technology-based scaffolding has emerged as an area of interest in EFL research, particularly in the context of grammar learning and comprehension. The current study sought to examine the impact of online teacher scaffolding on the grammatical proficiency of Indonesian EFL learners and the students' perceptions of the learning experience. For this purpose, 42 Indonesian EFL students, majoring in International Relations, were involved in this study. Utilizing a mixed method, this study employed t-tests to compare the efficacy of teachers' scaffolding in enhancing students' proficiency in online English grammar classes, with a particular focus on grammar for the TOEFL exam. Meanwhile, a semi-structured interview was employed to explore the students' perceptions regarding their experience in grammar online classes. The results showed that despite the limited duration of a few weeks, the post-test findings demonstrated a significant enhancement in the grammatical proficiency of Indonesian EFL learners through the implementation of technology-based teacher scaffolding. In addition, the students also elicited favourable responses regarding their participation in online grammar classes. The findings indicated that educators and instructors can effectively use certain scaffolding strategies in online learning for pedagogical purposes, especially online learning scaffolding for interaction.

Keywords: scaffolding strategies, online learning, poly-synchronous grammar course

Introduction

According to current trends, online education is becoming increasingly popular due to its suitability for learning participants' lifestyles, interests, and time constraints (Adedoyin & Soykan, 2020; Suwastini, Ersani, Padmadewi, & Artini, 2021), especially in EFL settings. Online learning is identically interrelated with flexibility (Suwastini et al., 2021) and students' autonomy (Inayati & Karifianto, 2022). To boost the students' learning autonomy and to cater for the learning process, specific scaffolding strategies should be implemented into online classes (Bautista, 2013; Dabbagh, 2003). In online learning, three types of distinguished

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interactions happen: learner-content interaction, learner-instructor interaction, and learner-learner interaction (Moore, 1989). Learners also interact with varied learning modalities of synchronous and asynchronous activities in a rich learning environment. According to sociocultural theory (Lantolf, 2000), language teachers should structure their classes so that learning is a socially mediated process that includes communicative activities. A successful learning process must be collaborative rather than unmediated or unassisted individual effort. The goal is for teachers to create experiences in which students learn from one another through collaborative activities (Ebrahimi & Sadighi, 2022; Kayi-Aydar, 2013). Thus, instructors use scaffolding strategies to promote interactions in online learning, which is astutely essential to assist the learning process.

Conceptually, scaffolding is a framework that allows the learner to pace and experience his or her learning in manageable chunks (Ahmadi Safa & Motaghi, 2021; Cho & Cho, 2016; Salyers, Carter, Cairns, & Durrer, 2014). The instructors' use of scaffolding strategies to promote interactions refers to some strategies for encouraging learner-instructor and learner-learner interactions in online environments, such as online discussions, individual learning, and group collaboration (Cho & Summers, 2012). This idea is supported by Vygotsky's concept (1978) of the zone of proximal development (ZPD), which is based on three stages of the learning process, including what the learner is unable to do, what the learner is able to do with assistance, and what the learner can do without assistance. According to Vygotsky, anything a learner needs to learn in an EFL setting, such as grammar, reading, writing, and other skills, must be within their cognitive capacity or ability to acquire that skill. Vygotsky (1978) referred to this cognitive ability as a student's "zone of proximal development." The instructor employs scaffolding techniques to achieve the desired learning outcomes. Having guidance or support from instructors or other knowledgeable individuals motivates and helps students achieve their learning objectives. Hence, scaffolding may boost motivation while accommodating the ability to self-regulate, self-assess, and interact with peers and the instructor (Salyers et al., 2014).

In online learning, four types of scaffolding are common: conceptual, procedural, strategic, and metacognitive, with the latter being the most frequently mentioned in previous studies (Jumaat & Tasir, 2014). To examine the effectiveness of scaffolding in an EFL online learning environment, in this research, the scaffolding is intended for online instructors' use of scaffolding strategies to promote interactions. Cho and Cho (2016) strongly suggested conducting empirical studies on the effectiveness of the online scaffolding framework. Further, scaffolding effectively fostered students' achievement in online learning (Bautista, 2013; Suwastini et al., 2021). The teachers are expected to enhance the interaction between students and their peers and between students and the teacher. Scaffolding strategies, for example, are used by online instructors to promote learner-instructor interactions by participating in discussions, posting regular messages, encouraging students to ask questions, proactively monitoring student progress, and recognizing students' contributions to the course. Online instructors also use scaffolding strategies to promote learner-learner interactions by establishing minimum rules for interaction, monitoring students' interactions and posing prompt questions (Cho & Cho, 2014; Cho & Summers, 2012). Those scaffolding strategies can be implemented in EFL online learning environments.

A plethora of scholarly studies highlighted that the employment of various scaffolding strategies effectively fosters students' motivation, engagement, satisfaction, and performance in online learning (Cho & Cho, 2014; Delen, Liew, & Willson, 2014; Glazewski & Hmelo-Silver, 2019; Jena & Gupta, 2019; Kim & Lim, 2019; Mamun, Lawrie, & Wright, 2020; Oh & Kim, 2016). Nevertheless, those studies should have discussed specific online scaffolding strategies for online instructors. More empirical research needs to be undertaken statistically to

define and measure the use of instructors' scaffolding in online learning. Further, not all online instructors understand how to encourage online interactions between students or between themselves and their students (Abdous & Yen, 2010; Cho & Cho, 2016). This research aimed to fill the gap by examining the impact of instructors' use of scaffolding in online learning and exploring the students' perspective as well.

Research questions

Two research questions were scrutinized as follows:

1. Does the implementation of online scaffolding strategies to promote interactions significantly affect the grammar achievement of Indonesian EFL learners?
2. How do Indonesian EFL learners perceive the teacher's use of online scaffolding strategies to promote interactions?

As a result, the findings shed light on EFL online education literature and provide a practical guideline for effective instructional strategies for online educators who strive to promote student interaction and engagement.

Literature Review

Teaching grammar in an online mode

Grammar is an essential part of language learning to master a language proficiently. Saeed et al. (2021) stated that computer-based learning in ELT has improved skills and expertise in using smartphones, word processing, online storage, and computer problem-solving. Meanwhile, the advent of Open Access Learning (OSL) and Learning Management Systems (LMS) as new advances in ELT technology has incorporated learning modes, including blended learning (Badaruddin, Noni, & Jabu, 2019; Ferheen Bukhari & Mahmoud Basaffar, 2019), e-learning (Ardinengtyas & Himawan, 2021; Eni Faridah, 2022; Xie & Zhang, 2012), and online assessment (Firdaus, Prastikawati, & Wiyaka, 2022; Haque & Md. Mozaffor Hossain, 2022; Sumardi & Muamaroh, 2020), showing ELT's development in the digital era.

In grammar teaching, the online setting presents both challenges and opportunities with various technologies. Take an example, Sugiyati and Indriani (2022) discussed the application of Teams-Game-Tournament (TGT) that improved grammar skills in an online learning setting, where students were engaged in grammar learning, suggesting a new approach. Furthermore, Du and Qian (2022) explained the use of Massive Open Online Courses (MOOCs), which showed different online and offline grammar teaching for English majors. In particular, Cahyani et al. (2021) investigated the strengths and weaknesses of online learning using synchronous and asynchronous modes. Their findings highlighted that most of the participants positively viewed the implementation of online EFL classes. In the same way, Zuhriyah and Laili (2022) explored that in grammar teaching, learning through both modes, synchronous and asynchronous, is effective and aids a blended approach. Khoiriyah (2021) and Hasanuddin et al. (2022) also mentioned that it has been proven that combining online learning with in-class learning effectively improves student achievement. Moreover, in online Grammar teaching during the pandemic, the polysynchronous approach is a valuable strategy proposed for foreign language teachers (Inayati & Karifianto, 2022). In another case, both synchronous and asynchronous modes of learning have been applied in Grammar classes with satisfactory results, although they are still rare (Zuhriyah & Laili, 2022). To conclude, despite the challenges, there are effective ways and strategies to enhance online grammar teaching.

There has been much research in computer-mediated teaching, such as online, self-study, or blended mode, which can enhance the acquisition of language skills, especially in grammar learning (Augustine, 2020; Cahyani et al., 2021; Halim, Wahid, & Halim, 2021; Inayati, Karifianto, Malang, Timur, & Email, 2022; Inayati & Mawan, 2021; Khoiriyah, 2021; Krajka, 2021; Sugiyati & Indriani, 2022; Zuhriyah & Laili, 2022). Switching from traditional teaching to online teaching is a new challenge for teachers. According to research by Sun and Chen (2016), well-organized content affects the effectiveness of online teaching, the interaction between teachers and learners, the interaction between well-prepared instructors, and so on. However, depending on the level of instructor control over online instruction, there are differences in the ways that technology is used to enhance, support, or augment grammar instruction. Hence, the teacher should assist the student's learning process appropriately.

Scaffolding in language learning

In English language learning, scaffolding is a term that refers to a supportive framework to help students gain language skills and abilities. This type of support can take many forms, as described in the literature. Therefore, according to Ebrahimi and Sadighi (2022), Scaffolding theory supports teachers in implementing a "student-centered" learning model and developing scaffolds according to students' current developmental areas to help encourage knowledge formation, helpful learning, and increase interest in English learning. This aligns with the understanding of scaffolding, which is temporary assistance that is gradually distributed, enabling students to do things independently (Dabbagh, 2003; Jena & Gupta, 2019). Scaffolding is also a way to support a person or group of learners in overcoming tasks that can be carried out efficiently. This is due to the new pro-concept skills and development needed for complicated tasks. Even in direct or internet classroom conditions, educators must help students move from their current abilities to better ones more quickly (Abdelaziz & Al Zehmi, 2021; Wilson & Devereux, 2014).

Hanjani and Li (2014) reported that language should fulfill three conditions to help improve collaborators' work: directing members' focus on the problem, providing solutions, and covering parts related to the task. Furthermore, scaffolding is not limited to student-to-student or teacher-to-student interactions, while technological tools are essential in improving the analysis of individual learning (Jena & Gupta, 2019). Additionally, Cho and Cho (2016) Additionally, it has been claimed that computer-based learning tools or software applications presented to learners can enhance their language interaction and discussion, as well as support students' attitudes. This is achieved by providing advanced explanations that help learners construct language knowledge, particularly in group work. Thus, scaffolding to initiate the interaction is essential to boost the learning process.

Scaffolding in online language learning

The virtual language learning scaffolding has differences from traditional learning in the classroom. In virtual learning scaffolds, teacher-students or peers experience difficulties collaborating because they are in different places. Additionally, it appears superior from a quality control perspective because teachers want to assess language learning achievements. Liu et al. (2022) pointed out that two possible scaffolds can be used during online learning. The first is scaffolding instruction in cooperative learning. In virtual learning, it is essential to pay attention to the instructor's apparent direction to reduce confusion and problems when students encounter the virtual learning environment, which is key to the success of cooperative learning. Scaffolding in cooperative learning must help students' intention to complete tasks and learning objectives. Scaffolding instructions provide encouragement and clarity to cooperative learning, while students encourage learning with group work. The second is scaffolding instruction in

quality control, in which the instructor provides clear resources to reduce the frustration and confusion that students experience. This scaffolding reduces students' disappointment, surprise, and uncertainty in language learning.

Additionally, in online learning, online instructors should also facilitate interaction during the designed learning activities. Moore (1989) suggested that three types of interactions are important when it comes to describing online learning. These interactions are learner–content interaction, learner–instructor interaction, and learner–learner interaction. Instructor scaffolding for interaction refers to instructors' implementation of instructional strategies to promote learner–instructor and learner–learner interaction. Within a virtual learning environment, learners have the flexibility to organize their timetable and determine when to fulfill the assigned work. However, they are not permitted to deviate from the prescribed path or disregard the provided instructions. Cho and Cho (2014) state that instructors are advised to supervise the learning process through distance control consistently. Clearly defining expectations at the start of the learning activity makes the assessment and feedback available to learners online. This enhances the learning process and facilitates adjustments to the quality and efficiency of learning.

Methodology

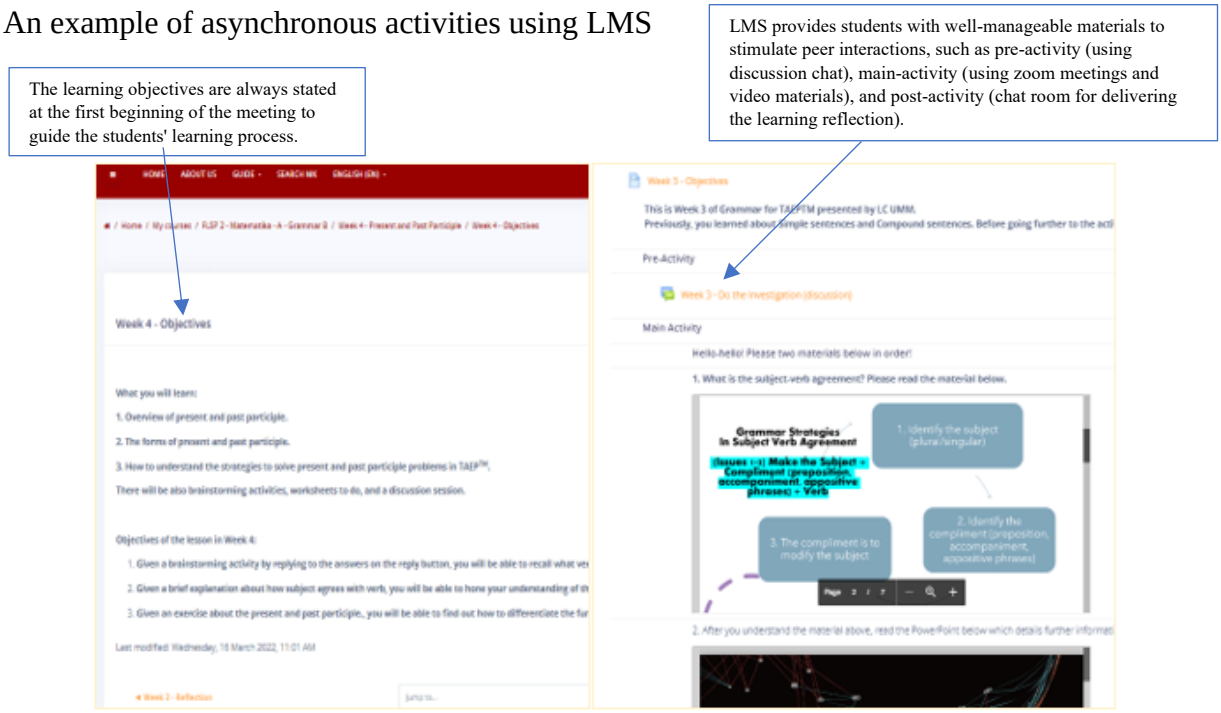
This study employed a mixed-method approach to investigate the impact of the teacher's use of online scaffolding to promote interaction and the students' perception of its implementation. The researchers expected to gain rich and broad objectives of this single study; hence, mixed methods combined with quantitative and qualitative approaches were carefully designed (Creswell, 2013). Forty-two EFL students majoring in the International Relations Department at one of the Indonesian higher education institutions are involved in this research. The students were joining a 16-week compulsory English course in a semester. The English course consists of two hours a week of grammar and reading skills for English test preparation. This research specified the learning objectives in grammar achievement for the Test of English as a Foreign Language (henceforth TOEFL). The researchers conducted a one-group pre-test post-test design for the first research question. The same independent variable was measured in a group of participants before and after treatment (pre-test) (Privitera & Delzell, 2019). The test result of students' grammar achievement was assigned as a dependent variable. The treatment was the teacher's use of online scaffolding to interaction adopted from Cho and Cho (2016) in a seven-week intensive polysynchronous approach focusing on the grammar part of a TOEFL-like test. The learning activities were guided into synchronous and asynchronous learning modes (see *Figure 1*).

All participants were asked to join the pre-test and post-test on the grammar of the TOEFL from the Longman Preparation Course (Phillips, 2003). This test was adopted due to its international standard and high level of reliability. Lastly, the outcomes of those tests were compared and analysed using JSAP. Descriptive analysis was conducted using the Wilcoxon signed-rank test to see the effect of scaffolding treatment on students' grammar achievement. The analysis of the Wilcoxon signed-rank test is a non-parametric test. The reason for using this test is that there are few samples in the one-group experimental design, so the data is not normally distributed. A survey was distributed to the participants to answer the second research question. The survey items consist of 12 closed-ended questions (co-opted from Cho and Cho, 2016) and one open-ended question to explore students' perception of the teacher's use of online scaffolding strategies in their grammar class. The result of the survey was then analysed descriptively using thematic analysis. This data analysis was adopted from Braun and Clarke

(2006). The researcher conducted this thematic analysis in four stages including *familiarization*, compiling written data and reading it carefully so that the researcher is truly familiar with the research data; *coding*, labelling and coding data about information; *generating themes*, deciding some themes for similar information; and *defining themes*; narrowing down the themes that have been found.

Figure 1.

An example of asynchronous activities using LMS



Findings and discussion

The impact of teachers' use of online scaffolding on students' grammar achievement

As suggested by the framework of online scaffolding to promote interaction, the treatment was implemented both for synchronous and asynchronous online learning modes. For example, during a synchronous video conference, the students were divided into small groups (facilitated by Zoom breakout rooms). Thus, the students were encouraged to interact with other students in a real-time discussion. Utilizing meeting chat was another attempt to stimulate interaction between teachers and students online. It facilitated the teacher and students to interact in real-time (such as responding to the teacher's questions, delivering a question, commenting, reflecting on the materials learned, and many more). Meanwhile, asynchronous online learning modes were designed using a learning management system (LMS) and WhatsApp group chat. The LMS was designed into four parts: pre-activities, main activities, post-activities, and reflections. An asynchronous discussion was initiated in pre-activity and reflection sessions.

After the treatment (eight meetings), the student's post-test score improved compared to the pre-test score. The researcher conducted a descriptive analysis and tested the Wilcoxon signed-rank test on the grammar achievement data before and after administering the treatment. The results of the Wilcoxon signed-rank test showed a significant difference in grammar achievement pre-test and post-test ($p<0.01$) with a significance level of 0.01%. The following data demonstrates the result.

Table 1

The result of the paired samples T-test

Paired Samples T-Test

Measure 1		Measure 2	W	z	df	p
Grammar Achievement pre-test	-	Grammar Achievement post-test	8.000	-5.884		< .001

Note. Wilcoxon signed-rank test.

Table 1 indicates a statistically significant difference between the pre-test and post-test scores. The significant difference is also evident from the mean values in the descriptive analysis. The students' grammar achievement before being given the scaffolding action was 68,447. After being given treatment, it had a mean of 80,766 (see Table 2). The difference in the mean score between the pre-test (M = 68.44, SD = 10.87) and experimental (M = 80.76, SD = 4.67) groups is meaningful, as the p-value shows <0.01. Additionally, in visual analysis, raincloud plots depict the significant improvement in students' grammar achievement (Figure 2), in which the distribution of items (subjects) between the pre-test and post-test has increased after being given scaffolding treatment. Thus, scaffolding can significantly increase grammar achievement in students' English learning, especially during online learning.

Table 2

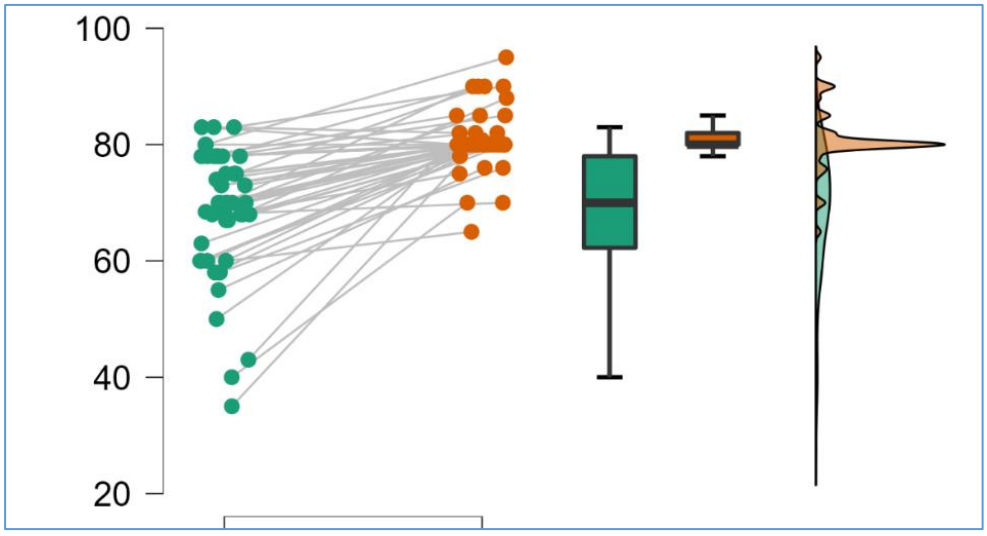
The result of the pre-test and post-test

Descriptives

	N	Mean	SD	SE	Coefficient of variation
Grammar Achievement pre-test	48	68.44	10.87	1.572	0.159
Grammar Achievement post-test	48	80.77	5.13	0.741	0.064

Figure 2

The results of pre-test and post-test in Raincloud Plots



This research investigated the impact of the independent variable (the teacher's use of online scaffolding to promote interaction) on the dependent variable (English grammar achievement)

in polysynchronous grammar courses. Using several scaffolding strategies to encourage student-student and teacher-student interaction, collaborative grammar learning, and ample support from the teacher enables students to enhance their grammar achievement. The result was congruent with previous research (Abdelaziz & Al Zehmi, 2021; Delen et al., 2014; Ebrahimi & Sadighi, 2022; Zhang & Quintana, 2012). Similar to that earlier research, scaffolding in online learning benefits students. Teachers in the modified role use scaffolding to assist students in building their knowledge and to promote effective learning. Students' learning challenges can be facilitated as long as an appropriate scaffolding is provided to offer learners external support (Cho & Cho, 2016; Glazewski & Hmelo-Silver, 2019; Nguyen, 2022; Oh & Kim, 2016; Suwastini et al., 2021). To conclude, the teacher's use of online scaffolding is justified as a valuable technique for improving Indonesian EFL grammatical understanding.

The students' perceptions of the teacher's use of online scaffolding to promote interaction in their online grammar class

The data analysis continued to delve into Indonesian EFL learners' perceptions concerning the implementation of scaffolding in their online grammar courses. The survey was administered, and the results are shown as follows.

Table 3

The result of descriptive statistics

Descriptive Statistics

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12
Valid	48	48	48	48	48	48	48	48	48	48	48	48
Missing	0	0	0	0	0	0	0	0	0	0	0	0
Mean	6.208	6.042	6.146	6.146	6.292	6.125	5.896	6.021	5.792	5.625	6.146	5.896
Std. Deviation	0.582	0.771	0.684	0.652	0.582	0.531	0.951	0.668	0.944	0.959	0.583	0.928
Minimum	5.000	3.000	4.000	5.000	5.000	5.000	1.000	4.000	2.000	4.000	5.000	3.000
Maximum	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000	7.000

The data above shows students' perceptions and self-reflection of the scaffolding given by the lecturer as a treatment for improving grammar achievement. There were 12 feedback items from students with an interval scale of 1 – 7. Each item is in the mean interval of 5.625 – 6.296. The highest item is in the assessment of "FLSP lecturers/instructors give messages to thank students for contributions or active participation during lectures". This result shows that scaffolding in the English learning process also requires a respectful attitude from lecturers towards their students because they have participated well in the learning process. While the other items are at reasonably high intervals, it means that students have a good enough perception of the treatment given. The result is shown in the following figure.

Figure 3

The result of students' perception in relation to the teacher's use of online scaffolding

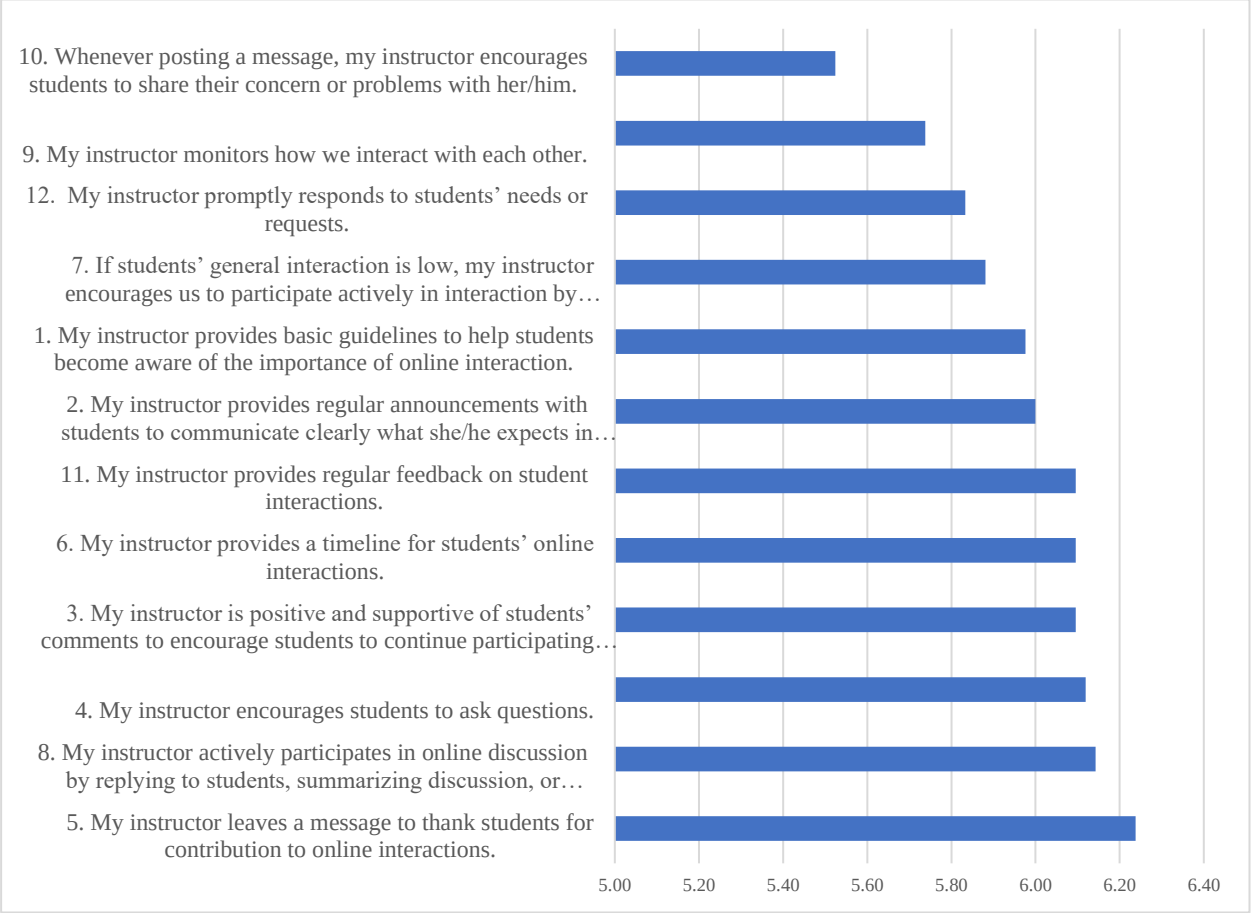


Figure 3 shows which teacher scaffolding strategies for online grammar courses effectively promote student interaction and engagement. Several treatments were emphasized for high student appreciation (with a mean score > 6.00). To be specific, the items "My instructor actively participates in online discussion by replying to students, summarizing discussion, or asking questions to students" (Mean=6.14), "My instructor encourages students to ask questions" (Mean= 6.12), and "My instructor is positive and supportive of students' comments to encourage students to continue participating in online interactions" (Mean=6.10) were related to the teacher's social presence. It can be stated that the students agreed that the teacher tried to get involved in their learning process. Such scaffolding strategies were vital to direct the student's learning process, especially in an online session. Since students usually feel isolated, the teacher's social presence might help them engage with the online session and overcome the challenges during online learning. This finding corroborated the prior research from Li (2022). She emphasized that students' perceived social presence is also a positive predictor of interaction, resulting in a higher interaction rate and a higher level of learning engagement in online EFL learning. Notably, the item "My instructor provides regular feedback on student interactions" (Mean=6.10) depicted that the students felt the teacher's guidance to have online group discussions or other online synchronous sessions. This means that those scaffolding strategies positively affected the students' perceptions. This excerpt was supported by the result of an open-ended survey as well. Some students felt they got ample synchronous guidance from the teacher during Zoom meetings and online discussions. For example, student 20 described how she was comfortable with the teacher's support during the online classes.

> *Having a real-time online meeting, such as using Zoom meeting, makes me easier to understand the materials. The teacher explains the materials clearly, and I can ask her directly whenever I have difficulties.* (Student 20, translated version)
>
> *During online learning, I like the way my lecturer delivers feedback. She always tries to give her feedback directly related to our learning and discussion. Thus, I can learn more about the materials and figure out my mistake* (Student 33, translated version)

From the excerpt, as mentioned earlier, a real-time online meeting facilitated students to get direct teacher support. Teacher-student interaction is crucial, especially in providing sufficient feedback on the student's learning process. Feedback received during learning has the potential to prompt reflective activities and increase learner comprehension (Wong et al., 2019). Further, some students expressed their positive learning experiences when they were asked to collaborate with their peers online. They loved to have group discussions since they could learn from each other, as shown in the following excerpt.

> *... In my view, students are more active in learning (more discussion) with each other. To me, I can learn and understand material from my friends.* (Student 17, translated version)
>
> *I like to join the class because there is more interaction between students and students and lecturers with students compared to just paying attention to presentations or PDFs shared via Zoom screen.* (Student 5, translated version)

As highlighted in the excerpt, the students stipulated their positive learning experience through group or peer discussion facilitated by the teacher. These findings were reinforced by the work of Ebrahimi & Sadighi (2022), who postulate that online collaborative learning significantly helps students to learn effectively and improve their grammar achievement. The collaboration in online learning is basically in line with the idea of ZPD (Vygotsky, 1978), in which the students are encouraged to learn from other, more capable peers. In conclusion, most of the respondents agreed that such scaffolding strategies were beneficial for their online learning, such as appreciating the students' participation during online classes, actively participating and monitoring discussions, delivering positive and encouraging comments to continue participating in class, setting a timeline, and providing feedback. In other words, those scaffolding strategies were deemed the social presence of the teachers during the online sessions. This result suggests that online teachers should consider scaffolding strategies to promote interaction in their English courses, as the students responded positively.

Conclusion

This research has implied that the teacher's use of online scaffolding significantly contributed to the development of EFL students' grammar achievement. The findings served as empirical evidence, highlighting the importance of using scaffolding in online EFL education since few prior studies have focused on its effectiveness. Concerning the students' perception, most of them viewed the teacher's use of online scaffolding positively. Promoting student-student and student-teacher interaction in online learning is crucial to deepen students' understanding while interacting with capable peers or teachers. Nonetheless, this study also shows some limitations. Firstly, the main restraint is the small sample size. A larger sample size can improve statistical power and the validity and generalizability of the study's findings. Secondly, this research only identified the result, not the online inquiry processes in understanding English grammar. Hence, further research is highly suggested to scrutinize the learning process and its relationship with

other related aspects such as student engagement, self-regulation, and other psychological constraints in individuals. Subsequently, further research will provide more robust findings related to the learning process.

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