Article

The Impact of Online Teaching on Interaction during the Pandemic: An Exploratory Study in CFL Classes

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Abstract
The Covid-19 pandemic caused a sudden shift in foreign language education from face-to-face instruction to online teaching in the United States over the spring of 2020. From perspectives of both teachers and students, this small-scale, exploratory study investigated the impacts of online teaching on class interactions during the pandemic. Twenty-three teachers and 24 students from college-level Chinese courses were surveyed online to solicit their perceptions of the impacts of online teaching on teacher-student and student-student interactions. One audio-clip of 50-minute elementary-level, online CFL class and a retrospective interview with the teacher of this class were also analyzed to provide an in-depth understanding of the online interaction. Findings showed the same or higher frequency of teacher-student interaction in online teaching as compared with that in face-to-face instruction, but the interaction became more teacher-initiated and teacher-centered. In addition, teacher and student participants perceived less interaction among students. The teacher participating in the retrospective interview reported changes in how she gave feedback in online teaching, e.g., when interacting with individual students, she tended to give explicit feedback; while interacting with the whole class, she was not able to provide immediate feedback due to technology constraints. Regarding the effects of these changes on L2 learning, participants voiced mixed opinions, but the majority evaluated the online student-student interaction as less effective than that in face-to-face instruction. The findings were discussed in light of the interaction approach of SLA, and corresponding pedagogical implications were proposed to foster the effectiveness of online instruction in CFL learning contexts.

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1 Introduction

In March 2020, the Covid-19 pandemic caused the suspension of face-to-face instruction at colleges and universities across the US and forced teachers to move courses online midway through the spring semester. For foreign language instruction, though online teaching is by no means new, most of it has been delivered face-to-face in the US, and the majority of teachers had no or limited experience with online teaching before. Hence, the sudden shift in the teaching mode during such a short period possibly impacted many aspects of foreign language teaching, especially the way that students interacted with teachers and peers in class. The interaction in online teaching differs from that in face-to-face instruction in many ways, and one key difference is the total separation of teacher(s) and students in space and/or time. Even in a synchronous online teaching environment, both teacher-student and student-student interactions can only be achieved and mediated by online tools/platforms.

Informed by the interaction approach to second language acquisition (SLA), both researchers and teacher-educators argue for a strong need to promote interaction in foreign language instruction. Empirical evidence shows students interacting with teachers or peers is beneficial to their second language (L2) development (e.g., Iwashita, 2003; Mackey, 1999; Mackey & Philp, 1998; McDonough, 2005), in that it affords students the opportunities not only to practice using L2 but also receive immediate feedback on their production.

While much research examined learners/teachers' views of the online instruction in general, the number of studies investigating the features and the processes of interaction in fully online teaching environments has been relatively small (e.g., Heins, Duensing, Stickler, & Batstone, 2007; Schulze & Scholz, 2018; Tseng, Lin, & Chen, 2018). The sudden shift in the teaching mode during the pandemic might affect interaction differently than the regular online instruction when teachers had more time to prepare, but little research has explored how interaction was initiated and mediated in online teaching during the pandemic, especially when both teachers and students were thrown into the new teaching mode midway through a semester. In addition, it is reported that learners of less commonly taught languages appear less prepared for the online instruction than those of commonly taught languages (Winke, Goertler, & Amuzie, 2010). This emphasizes the need for more investigations into the online teaching in less commonly taught languages, such as Chinese. To fill in the gap and learn how the pandemic background possibly reshaped foreign language teaching, this small-scale, exploratory study investigated the potential impacts of online teaching on the quantity and quality of interaction in Chinese as a foreign language (CFL) classes during the pandemic. The findings of the study are expected to not only uncover the possible changes in the features of interaction in such a special background but also give new insights into how to promote the effectiveness of online instruction in CFL learning contexts.

2 Literature Review

2.1 Theoretical framework

Within L2 teaching and learning contexts, interaction generally refers to the conversation that learners participate in with teachers or peers. The importance of fostering interaction is theoretically supported by the interaction approach to SLA. From a cognitive perspective, it accounts for how input, interaction, output, and feedback contribute to L2 development.

It is now commonly accepted in SLA literature that interaction promotes L2 learning (Gass & Mackey, 2007, 2015). According to Long (1983, 1996), the negotiation for meaning that occurs in interaction, especially the interactional adjustments made by interlocutors, makes the input that learners receive more comprehensible. Learners can also attain meaning and shared understanding

through interaction, thus having different aspects of their linguistic competence developed. In addition, the feedback learners receive during the interaction provides them with negative evidence, which directs learners' attention to the problematic aspects of their knowledge and prompts them to notice the gaps in their production. By interacting with either more competent interlocutors or peers, learners are given the opportunities for language use as well as the chance to test language-related hypotheses, and more important, are pushed to produce modified output, thus promoting not only automaticity but also accuracy of learners' production (Swain, 1995, 2005).

Grounded in this theoretical framework, teacher-student and student-student interactions are of significance to learners' L2 development in both face-to-face and online teaching environments. The potential benefits of interaction may lie in the opportunities it offers for students to engage in L2 practice, the more comprehensible input made by the interactional adjustments provided by teachers, and the immediate feedback given by both teachers and peers, which enables students to notice the incorrectness or problems of their production.

2.2 Empirical studies on interaction in different L2 learning contexts

A wealth of empirical research concludes that face-to-face interaction contributes positively to L2 development (e.g., Iwashita, 2003; Mackey, 1999; Mackey & Philp, 1998; McDonough, 2005). In line with its theoretically-supported benefits discussed above, interaction has been found to facilitate L2 learning in terms of (a) the positive effects of negotiation for meaning on the quality of learners' immediate production (e.g., Holiday, 1995) and later language use (e.g., Gass & Varonis, 1994; Nobuyoshi & Ellis, 1993), (b) the more precise, fluent and appropriate output that interaction pressures learners to produce (McDonough, 2005; Nobuyoshi & Ellis, 1993), and (c) the feedback from teachers or peers that enhances L2 grammatical development and overall accuracy (Carroll & Swain, 1993; Iwashita, 2003; Sato & Lyster, 2012).

In addition to face-to-face interaction, a number of studies explored online teaching environments that afford students different types of online interaction, but reported mixed findings about how learners and teachers viewed the online teaching in general. The students in Murday, Ushida, and Chenoweth (2008) reported a trend of increasing satisfaction with the hybrid course over time, compared with face-to-face instruction. Similarly, the teachers in Manegre and Sabiri (2020) expressed enthusiasm, enjoyment, and high perception of online teaching, especially when class sizes were small. However, other studies reported unfavorable opinions of online teaching from students. The learners in Alhamami (2018) expressed strong intention to choose face-to-face language classes rather than online courses, shaped by the beliefs of the people around them, their attitudes toward the online teaching environment, and their beliefs about their abilities to perform in the face-to-face learning environment.

Among this body of research, a few studies examined learners' perceptions of interaction happening during online instruction, in addition to their general views of online teaching. Recruiting learners enrolled in asynchronous L2 German online classes, Schulze and Scholz (2018) explored their perceptions of the combination of asynchronous written, spoken interaction and synchronous written interaction that worked as a supplement to the asynchronous online instructional modules. Overall, the learners expressed much lower satisfaction with their online versus face-to-face learning experience and reported the lack of personal contact during the online instruction. In particular, most of them regarded the interaction happening in the asynchronous online teaching environment not as personal commination because they conceptualized interaction as only spoken and face-to-face communication. Schulze and Scholz's (2018) study shed insightful light on learners' perceptions of interaction in online teaching, but since it was situated in an asynchronous online teaching context, its findings may not be applicable to the teaching environments where the synchronous online instruction dominates. Of

direct relevance to the current study, the studies exploring the features and the processes of interaction happening in synchronous online teaching environments are discussed below.

Heins, Duensing, Stickler, and Batstone (2007) investigated the spoken interaction in online tutorials as compared with that in face-to-face sessions. Participants were 16 beginning-level L2 German learners, with 12 attending online tutorial sessions taught by tutors while the rest participating in the comparable face-to-face sessions. The recorded sessions were coded in terms of interactional features (e.g., L2 input/output, use of L1/L2, etc.) and compared for similarities and differences between the online and face-to-face modes. The findings showed spoken interaction took place successfully in both modes, and learners in both modes could produce comprehensible input and output. However, the interaction in the online mode featured a higher ratio of L2 input and output provided by learners but fewer student-student exchanges outside the tutor-assigned tasks. Though this study uncovered a number of differences in the spoken interaction within face-to-face and online teaching environments, it failed to show the whole picture of interaction in online teaching mode, in that it focused on tutorials instead of formal classes taught by professional foreign language teachers.

Focusing on CFL learners, Tseng, Lin, and Chen (2018) designed a 12-day immersive online high-school Chinese course (including synchronous sessions and interactive, web-based tasks), and surveyed 35 high-school students for their learning outcomes and opinions of the learning experience. Overall, learners reported a highly satisfying experience with this course, as well as improvement in L2 Chinese skills. Regarding the interactions occurring during the online sessions, the results showed most of them took place between teachers and students, and the level of student engagement was the highest when students interacted with teachers. By contrast, students' level of interaction with peers in L2 Chinese was low, possibly due to the lack of sufficient opportunities to engage in pair work in synchronous sessions. The level of student engagement associated with peer interaction was also the lowest as compared with other activities. In addition, students perceived lower anxiety during the synchronous sessions than in face-to-face instruction. Through a survey approach, this study reported insightful findings about student perceptions of the online teaching, as well as their perceived progress in Chinese skills. However, their participants were restricted to high-school students and the online course only lasted 12 days. Hence, it is unclear to what extent these findings could be transferred to college-level learners, especially when the online teaching may last longer. In addition to the surveys, other types of data collection methods, such as interviews with teachers and students, and recordings of classes, should be employed to fully understand the features and processes of interaction during online teaching.

To summarize, prior research reported mixed perceptions of the online teaching environment from students and teachers. While interaction plays an essential role in determining the quality of online teaching, existing research on the features and the processes of interaction in synchronous online teaching environments is still limited. In addition, previous studies failed to do data triangulation for lack of multiple data sources. According to Winke, Goertler, and Amuzie (2010), learners of less commonly taught languages self-reported lower levels of computer literacy and less interest in taking courses with synchronous online teaching components than those of commonly taught languages. This suggests a need for more investigations into the online teaching in less commonly taught languages, such as Chinese. Especially, the sudden shift in the teaching mode during the pandemic might affect interaction differently than the regular online instruction when teachers had more time to prepare. Hence, this exploratory study focused on CFL classes and examined the potential impacts of online teaching on teacher-student and student-student interactions during the pandemic. The research question that guides the study is: did the online teaching change the interaction in CFL classes during the pandemic, as compared with face-to-face instruction? If yes, how?

3 Methodology

This study employed a survey approach, supplemented by the class recording and the retrospective interview, to explore the features of online interaction in CFL contexts during the pandemic.

3.1 Participants

Participants in this study were recruited on a voluntary basis, including both teachers and students. They engaged in online teaching or learning in Chinese over the spring of 2020 due to the Covid-19 pandemic. As part of a larger research project, 23 college-level CFL teachers from 14 US public universities took the survey on their perceptions of the potential impacts of online teaching on interaction. They aged between 30 and 50 years old and had four to 20 years of Chinese teaching experience. Among these teacher participants, five claimed having taught Chinese language courses online before the pandemic. In addition, one college-level CFL teacher in her mid-thirties agreed to have her recorded online Chinese language classes observed. She had 10 years of college-level Chinese teaching experience and was working full-time at a large public university on the east coast of the United States.

For the 24 student participants (11 females, 11 males, and two who did not specify their genders) that were surveyed, they were undergraduate students from four US public universities, with prior formal Chinese instruction ranging from less than one year to six years. Twenty of them spoke English as their first language (L1) while the remaining were Spanish, Hebrew, Korean, or Polish L1 speakers. At the time of data collection, two students were taking third-year Chinese classes, while 10 and 12 students were enrolled in second-year and first-year Chinese classes respectively. None had any experience with online learning prior to the pandemic.

3.2 Instruments

Two online Qualtrics surveys were developed based on Tseng et al. (2018) to solicit participants' perceptions of the potential impacts of online teaching on interactions in CFL classes, with one survey targeting teacher participants and the other student participants. Both surveys had three sections, including multiple-choice and open-ended items. The three sections covered questions on (a) participants' demographic information, (b) their online teaching/learning experience over the spring of 2020, (c) their perceived changes in class interactions during online teaching as compared with those in face-to-face instruction, and reflections on the effectiveness of the online interaction. For the items on class interactions, the two surveys focused on both teacher-student and student-student interactions (see Appendix for sample survey questions). After the surveys were drafted, they were first piloted among a small group of participants for feedback, and then were revised in both language and content based on the feedback before the final versions were ready.

In addition to the surveys, one audio-clip of the recorded online Chinese teaching sessions from the volunteer CFL teacher was randomly selected and analyzed. The audio recorded 50-minute, Zoom-delivered online instruction from a first-year college-level Chinese language class near the end of the spring semester. On the day when the online session was recorded, 13 American undergraduates received the instruction and engaged in the practice on the new vocabulary, grammar, and textbook dialogue from a lesson on "seeing a doctor." Then responding to the audio and her teaching slides on the lesson, the CFL teacher participated in an approximately 75-minute retrospective interview in English. Corresponding with the items on class interactions in the surveys, the interview also included questions on both teacher-student and student-student interactions (see Appendix for sample interview questions). These interview questions were used to guide the teacher to think back on her instruction process, compare the interaction occurring during the 50-minute teaching period with that in her face-

to-face instruction before the Covid-19 pandemic, and identify any changes in how the interaction was conducted. As a supplement to the survey data, the audio and the interview were included for analysis to provide an in-depth understanding of the changes that occurred to the interactions during online Chinese instruction, and were also compared with what participants reported in the surveys for data triangulation.

3.3 Data analysis

Guided by the research question, the participants' responses to the open-ended questions in the surveys were coded according to three themes: (a) their perceived changes in teacher-student and/or student-student interactions, (b) the possible effects of the changes on students' L2 learning, and (c) their evaluation of the effectiveness of the interaction during online teaching compared with that in face-to-face instruction. And their responses to the multiple-choice items were analyzed to calculate the percentage distribution of their opinions/choices.

The 50-minute recorded online teaching session was first divided into four sections based on the instructional content, i.e., introduction (i.e., greeting students and introducing what to be covered in the session), vocabulary instruction, grammar instruction, and dialogue review. Then each section was segmented into interaction-related episodes, i.e., the conversation(s) students participate in during the instruction with the purpose of completing a particular task. For example, to teach students a new word in class, the conversation that the teacher initiated with the participation of student(s) was considered an interaction-related episode, in which the teacher could converse with a student or more than one student. Then the number of interaction-related episodes within each section was counted and the different teacher-student or student-student interactions within the episodes were identified. In addition, the responses the teacher produced with the retrospective interview were transcribed and coded in terms of (a) the changes identified compared with the face-to-face instruction and (b) the reasons that caused the changes.

The analysis of the data, including coding of survey and interview responses, as well as the segmentation of interaction-related episodes, were conducted by the two authors of the study. They first randomly selected a sub-set of the data, independently analyzed them, and achieved high agreements in both coding (96%) and segmentation (93%). Then they independently analyzed the remaining data, and discussed the discrepancies to reach consensus.

4 Results

This section presents the results in three parts: (a) student survey responses, (b) teacher survey responses, and (c) the teaching audio and retrospective interview responses in order to have the analysis results of different data sources clearly reported.

4.1 Analysis of student survey responses

Seventy-five percent of the student participants reported their online Chinese classes were delivered synchronously, with the rest having the instruction in a mixed manner (i.e., a mix of synchronous and asynchronous). However, all the synchronous teaching was primarily delivered via Zoom and PowerPoint slides.

When asked whether they perceived any changes in teacher-student interactions, students voiced mixed opinions. Nine students clearly indicated no change as compared to face-to-face instruction because they observed the same amount of speaking opportunities and interaction with the teacher(s). By contrast, the other 15 students reported otherwise. According to their observations, the teacher

often repeated questions several times due to the internet issues; as a result, a lot of interaction was stalled and became awkward since students had to wait longer. Three of them also reported a higher frequency of their interaction with the teacher in online teaching, but they still found it less meaningful/focused because Zoom added a certain anxiety to the answering of questions when compared with the face-to-face interaction. Corresponding with their perceptions of the changes in the interaction, the 15 participants all considered the changes hindered their language learning in some way, as shown in Figure 1.

Do you think the changes benefited or hindered your language learning?	If yes, in what way and why?
They definitely hindered.	*Because the technology does not have the capacity yet to support all the needs. Sometimes the connection was very bad and the audios could not play.*
To some extent they hindered my language learning.	*Because we definitely weren't as immersed in the language. Less opportunity to practice speaking and less opportunity for questions, I think.*
I think it hindered a lot.	*Because we had to adjust to communicating virtually which is not easy. The remote teaching prevented the language from being practiced and rehearsed in a more natural way.*
Hindered.	*Hearing the other students in class is different than online, and I was scared and anxious at all times in class.*

Figure 1. Student perceptions of the effects of changes in teacher-student interaction

With respect to the possible changes in student-student interactions, all students unanimously stated they had much less interaction with peers. As pointed out by one student, *"there was less time to bond with one another on a personal level or learn incidental information. I used to have a lot of personal discussions with my classmates. During remote learning, however, we almost never engaged with other classmates."* When asked about the possible effects of the change on their L2 learning, most of the participants thought the reduced amount of interaction with peers influenced their Chinese learning negatively because they valued and missed the rich learning and practice opportunities from classmates during face-to-face instruction. However, it should be noted that three students expressed uncertainties about the effects of the change in the student-student interaction, in that the less interaction with peers required them to handle questions independently in class, which they kind of liked. One of the students from a first-year Chinese class also commented, *"I'm not sure. When communicating in class, we would usually use English, meaning we weren't really practicing or improving our Chinese."*

Last but not least, the student participants were asked to evaluate the effectiveness of the interaction during online teaching, as compared to that in face-to-face instruction. As summarized in Figure 2, their opinions on the teacher-student interaction were varied, whereas their views on the student-student interaction were unanimous. Nonetheless, overall, most of the students considered the two types of interactions in online teaching less effective.

Teacher-Student Interaction	Student-Student Interaction
About 70% students considered it <u>less effective</u>, e.g., *"Definitely less effective. Zoom is not a good replacement for the real classroom in terms of the interaction."* *"Teacher student interaction was not as effective due to loss of eye contact and body language, as well as difficulties with technology."*	It was <u>less effective</u>, E.g., *"There were much less opportunities for students to engage with each other during class time."*
About 17% students considered it <u>as effective</u>, e.g., *"It was as effective as in-person learning, if not more. I could communicate with the teacher via private messages, and could schedule Zoom meetings. With those meetings, I could have almost like an additional private lesson to review material I don't understand, ask questions or for clarification."*	*"When students were in a separate chat room, a lot of the time they didn't actually do the work because the teacher wasn't there."*
About 13% students considered it <u>somewhat effective</u>, but <u>not as effective</u> as face-to-face instruction, e.g., *"It was still kind of effective, but it will never be as effective as in-person interaction. I think the professor made the best attempt to treat interactions the same."*	

Figure 2. Student perceptions of effectiveness of interactions in online teaching

4.2 Analysis of teacher survey responses

Analysis of teacher survey responses revealed that 14 out of the 23 teacher participants taught synchronously while the remaining adopted a mix of synchronous and asynchronous instruction. Similar to students' responses, teachers also reported that Zoom and PowerPoint slides were the most popular online tools/software for delivering synchronous instruction.

Eighteen out of the 23 teacher participants perceived changes in teacher-student interactions. As reported, the interaction was more teacher-initiated and teacher-centered compared with that in face-to-face instruction, in that the teachers tended to use more mechanical drills or to elicit more questions from individual students in order to check their understanding. Three teachers even indicated that students became quieter, more passive, and less willing to ask questions in online teaching. In addition, five out of the 23 participants observed an obvious reduction in the frequency of the teacher-student interaction while the majority reported the same or even increased amount of interaction between the teacher and students in remote teaching. When it comes to the effects of these changes on student's L2 learning, the teachers had different opinions, as shown in Figure 3.

Do you think <u>the changes</u> benefited or hindered students' language learning?	If yes, in what way and why?
Around 43% of teachers considered the changes benefited students' Chinese learning.	(a) They increased student learning autonomy, e.g., *"Accountability at the individual level was increased significantly."* *"They can learn to be more proactive."* (b) They provided students with more individualized and interactive practice, e.g., *"I interacted more with individual students. I think this should have benefited students since they got more opportunities to practice with their teacher."* *"More individualized and concentrated practice time."*
Around 57% of teachers considered the changes hindered students' Chinese learning.	(a) They caused less interaction between students with peers, e.g., *"Lack of student-student interaction;"* *"I guess I had less time in class for student-student interaction."* (b) They lowered classroom vibe, e.g., *"Class was less engaging with only interaction between me and students."* *"Sometimes I had to double check whether they were able to listen clearly and such interaction was not meaningful, not making them engaged at all."*

Figure 3. Teacher perceptions of the effects of the changes in teacher-student interaction

Similar to the observations of student participants, 19 out of the 23 teachers reported less interaction among students because they used much less pair/group work in online teaching due to technology constraints. They also worried that they would lose control when pairing/grouping students within breakout rooms via Zoom since they could not check and provide scaffolding as easily as in classrooms. *"It was hard for me to check what each pair was doing, so it was possible that students would lack self-discipline to stay on track. If they did not do what they should do, I had no way to find out,"* as indicated explicitly by one teacher. Overall, such change in the student-student interaction during online teaching was considered having hindering effects on student learning. As frequently commented by the teachers, *"the lack of free conversation with their peers made it hard to build a community in the class. Since students interacted with their classmates less frequently, the potential benefits of collaborative learning were lost."*

When asked to evaluate the effectiveness of the interaction in online teaching, the teachers expressed mixed opinions over the teacher-student interaction, though 76% of them considered it less effective as compared with that in face-to-face instruction. For the student-student interaction, 79% of the teachers perceived it less effective, as summarized in Figure 4. However, three teachers commented that the student-student interaction could be equally effective if better online tools/platforms for conducting pair/group work were available.

Teacher-Student Interaction	Student-Student Interaction
(a) Around 76 % teachers considered it <u>less effective</u>, e.g., *"Although most teacher-student conversations and asking-answering could be realized in online teaching, I couldn't see students' body language, and neither did they."* *"The lack of eye contact and unstable internet caused problems."*	It was <u>less effective</u>, e.g., *"Much less opportunity for student-student interaction;"*
(b) Around 14 % teachers considered the effectiveness <u>depended on</u> the internet, types of interaction, etc. E.g., *"If we could have reliable internet connections and have more experience in handling online teaching/learning, it is possible that the teacher-student interaction be as effective."* *"The very basic drill or grammar/vocab explaining between teacher and students is fine."*	*"Conducting of pair/group work via Zoom was very time consuming;"*
(c) Around 10% teachers considered it <u>almost equally effective</u>, e.g., *"Almost equally effective, because Zoom provides many useful functions that made the interaction between me and students almost the same as that in classroom teaching."*	*"The teacher could not provide immediate feedback and scaffolding to all pair/group work. Hence, for students who were not very disciplined, they would do non-task related things."*

Figure 4. Teacher perceptions of effectiveness of interactions in online teaching

4.3 Analysis of teaching audio and retrospective interview responses

Among the four sections of the 50-minute online teaching audio, the vocabulary instruction was found to have the largest number of interaction-related episodes (i.e., 20 episodes), followed by the grammar instruction segmented into four episodes; whereas the introduction and dialogue review both included only one interaction-related episode. What occurred in these episodes were all teacher-student interactions, except for one instance of student-student interaction that happened when the teacher was offline due to unreliable internet connection. In addition, all of the teacher-student interactions were initiated by the teacher, e.g., the teacher modelling a new word followed by the chorus of all students,

the teacher asking questions followed by students' responses, and the teacher providing a student individualized feedback in response to his/er answer. Only one instance of student-initiated interaction was observed, in which a student asked the teacher for clarification on vocabulary use.

Analysis of the teacher's retrospective interview responses revealed that the online teaching had shaped the interaction in several different ways from that in face-to-face instruction. First, the amount of the student-student interaction greatly reduced. According to the teacher, the breakout room within Zoom was not that user-friendly for conducting pair/group work; it was very time-consuming every time the teacher went in and out of a room to check pair/group work, thus making it impossible for her to observe each pair/group and provide them with simultaneous feedback. As the teacher explained, she *"often dropped off when I (she) tried to enter breakout rooms. So I (she) did not have enough time to check all groups and could not provide verbal feedback simultaneously for groups which I (she) did not check."* As a result, the teacher-student interaction, especially that with individual students, was more often adopted to replace the student-student interaction. According to the teacher interviewed, frequent interaction with individual students was extremely helpful during online instruction because it was *"one of the very few ways that I (she) could use to check student understanding in remote learning,"* by which students could also be more concentrated. Another noticeable change perceived in the teacher-student interaction was the teacher's intentional attempts to repeat multiple times and speak more clearly whenever modeling new words or grammar patterns. She did this to ensure students were able to get adequate input in case of sudden, unstable internet connection. In addition, great difficulty was reported in modeling character handwriting during online teaching, in that modelling how to handwrite characters stroke by stroke using a mouse or a stylus on the screen was not as easy as on the blackboard in classroom instruction. However, modeling long phrases or sentences was facilitated since typing on the screen was not only easy but also faster than writing by hand.

Online teaching also influenced how the teacher gave feedback in class. The teacher mentioned she tended to provide students with direct corrections rather than other types of feedback, as shown below.

> *"In remote teaching, I had to speed up and make my feedback more concise. Class time was often wasted due to unpredictable technology problems or students' not paying attention, and in many cases I was not sure if they heard me well. As a result, I chose to directly provide them explicit corrections instead of other types of feedback, especially those that gave them time to notice and fix problems by themselves, as I often did in face-to-face instruction."*

In addition, the teacher noted that while she could provide feedback when interacting with individual students, she had no way to provide simultaneous feedback if students responded in chorus, *"When teaching a large class, I had to ask students to mute themselves to avoid background noise which was very distracting. Since they were muted, I had no idea if they responded or responded correctly. As a result, I could not give feedback."*

5 Discussion

5.1 Teacher-student interaction

Results of the survey responses and the 50-minute teaching audio both showed participants perceived the same or even increased amount of teacher-student interaction in online teaching, as compared with that in face-to-face instruction. The findings corroborated what Tseng et al. (2018) found in their study, where most of the interaction during synchronous sessions also took place between teachers and students. Informed by the interaction approach of SLA, the increased teacher-student interaction likely promotes L2 learning, in that it could provide students with not only more target input but also immediate feedback that improves the accuracy of their L2 production (Long, 1983,

1996). Hence, 43% of the teacher participants considered it benefited student learning. However, the majority of student participants and 57% of the teacher participants thought the changes in teacher-student interaction hindered students' L2 development. This might be explained by the quality of the interaction. Although the amount of teacher-student interaction was perceived to have increased, the interaction became more teacher-centered and teacher-initiated, as reported by many teachers. This made students less engaged and less active than in face-to-face classes. In addition, technology constraints possibly made the teacher-student interaction less efficient. Many participants surveyed, as well as the teacher who participated in the retrospective interview, reported teachers had to repeat questions several times in case of unstable connections on the internet, which made students wait longer and even idle around.

Online teaching also influenced how the teacher gave feedback in class. With the increase of teacher-initiated interaction, teachers provided individual students with more feedback, which likely enhanced their L2 grammatical development and overall accuracy (Carroll & Swain, 1993; Iwashita, 2003; Sato & Lyster, 2012). In addition, the teacher interviewed reported she tended to provide corrections directly instead of giving students other types of feedback, especially those often used in her face-to-face instruction which could guide students to notice and fix problems by themselves. In other words, online teaching restricted the teacher's choice of feedback in some way. Although correction may help students notice the problem immediately, other types of feedback (e.g. prompts) are likely to elicit modified output from students in addition to drawing their attention to the problems. Hence, the adoption of a variety of different types of feedback might have more facilitating effects on both fluency and accuracy of student production.

5.2 Student-student interaction

Most of the teacher and student participants reported a large reduction in the frequency of student-student interaction. This was supported by the analysis of the 50-minute teaching audio, in which only one instance of student-student interaction was observed. Such change was primarily caused by technology constraints and internet problems. As surveyed by teachers, it cost much time to enter and leave a breakout room via Zoom, and the teacher interviewed also pointed out that she often dropped offline when trying to enter the room. The results corresponded with those in prior research (e.g., Heins et al., 2007; Tseng et al., 2018), which found online teaching featured fewer student-student exchanges and a lower level of student engagement in pair work than face-to-face instruction. With respect to the effects of the reduced amount of student-student interaction, the majority of both teacher and student participants considered it negatively impacted student learning. Following the interaction approach (e.g. Gass & Mackey, 2007, 2015), learners interacting with peers not only affords them more opportunities to practice L2 but also enables them to receive immediate feedback from peers, which is equally beneficial to their L2 development as compared with interacting with teachers in class. In addition, the pair/group work among students could add variety to class interactions and increase classroom vibes, making students feel more engaged. Hence, it was not surprising that the participants complained about the reduction in the frequency of the student-student interaction in online teaching.

6 Implications

Despite being a small-scale, exploratory study, its findings showed the online interaction during the pandemic shared similar features as that in regular online instruction, and thus shed insightful lights on the promotion of future online instruction in CFL learning contexts. The survey results showed 43% of the teacher participants thought the interaction during online teaching benefited student learning. This suggests the potential of delivering language instruction online, even when teachers had limited

time to prepare for it during the pandemic. However, when compared with face-to-face instruction, much improvement should be made to maximize the benefits of online teaching for students' L2 development. As discussed previously, the large reduction in the amount of pair/group work, as well as the frequent teacher-initiated interaction, made students feel less engaged. Responding to this problem, teachers could increase the variety of class interactions by designing online activities/tasks that encourage not only pair/group work among students but also provide students with more opportunities to initiate interaction with teachers (e.g., asking students to interview the teacher using target words or patterns instead of only teacher-initiated mechanical drills). The teacher who participated in the retrospective interview also expressed concerns over her difficulty in checking student answers or giving them feedback when students responded in chorus, since she had to mute students in Zoom to avoid distracting background noise when teaching a large class. This might imply a preference for small class size in online teaching to make teachers more easily provide students with feedback.

In addition to the improvement that teachers can make in course design, we must acknowledge the importance of technology in conducting effective online teaching especially during the pandemic; i.e., we need to explore other good tools/platforms and integrate them into online instruction, and also look forward to advances in technology that can fix current technology issues faced by teachers and L2 learners. As discussed previously, many teachers chose to conduct less pair/group work because of their concerns over the internet and technology issues (e.g., the problem with the breakout rooms in Zoom). For Chinese character instruction in particular, the teacher interviewed explicitly suggested a need for effective online tools to help students learn and practice character handwriting, since it was not easy to use mouse or stylus to show students how to handwrite characters stroke by stroke on the screen.

7 Conclusion

Situated in the pandemic background, this exploratory study reported several changes in teacher-student and student-student interactions during online teaching as compared with face-to-face instruction. Some of the changes were perceived beneficial to L2 learning, suggesting the effectiveness of online instruction during the pandemic. However, the online teaching might not be equally comparable to face-to-face instruction in mediating effective interaction, with the current tools/platforms available. Based on the findings, implications regarding how to promote the effectiveness of online instruction in CFL learning contexts were discussed. However, we should be cautious in interpreting the findings because of the small sample of the study. To increase the generalizability of the findings and provide more in-depth understanding of the impacts of online teaching on interactions, future research should not only recruit more participants but also collect recorded online teaching sessions from different levels of Chinese classes. In addition, both teacher and student participants in this study varied a lot in their backgrounds, such as gender, previous Chinese teaching or learning experiences, etc. It would be insightful in future investigations to examine whether participants' backgrounds possibly influenced their perceptions of the class interactions during online teaching.

Appendix

Sample Survey Questions

1. Did you notice any changes as compared with the face-to-face instruction in terms of teacher-student interaction (i.e., the interaction between students and teachers in class)? For example, its frequency in class, what was discussed in the interaction, etc.

2. Do you think these changes benefited or hindered your language learning? If yes, in what way and why? Please specify.

3. Did you find any features or benefits of interaction that happened during remote/online teaching but did not exist in face-to-face teaching? If yes, what were they? Please specify.

4. To what extent do you think the student-student interaction during remote/online teaching was as effective as that in face-to-face instruction? And why?

Sample Interview Questions

1. Was the interaction initiated in exactly the same way as that in face-to-face instruction? If not, how was it different?

2. Was the student-student interaction initiated as frequently as you did in face-to-face instruction? If not, how was it different?

3. During the interaction, did you provide feedback on the student(s)' production in exactly the same way as that in face-to-face instruction? If not, how was your feedback different from that in face-to-face instruction?

4. Did the student(s) respond to your feedback in exactly the same way as that in face-to-face instruction? If not, how was it different?

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新冠疫情背景下的在线网络教学对课堂互动的影响：汉语作为外语教学情境中的探索式研究

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摘要

2020 年春季新冠疫情的爆发，使美国的外语教学从面对面的课堂教学突然转变为线上网络教学。为了研究新冠疫情背景下在线教学可能对课堂互动带来的影响，这篇文章采取问卷调查的方式，对来自美国大学的 23 名汉语教师和 24 名汉语二语学习者关于线上教学对课堂互动的影响进行了探索式的研究。此外，文章还录音并分析了一名汉语教师的一堂 50 分钟的线上教学，并对这名汉语教师进行了回顾式访谈，来辅助分析问卷调查的结果。研究发现，与面对面的课堂教学相比，线上教学中的师生互动频率有了明显的增加，而且主要以教师发起互动为主，并且多以教师为互动的中心。此外，教师和学生都报告了学生与学生之间的互动频率明显减少。在回顾式访谈中，汉语教师也指出了网络教学影响了她提供教学反馈的方式，比如，在和个别学生进行互动的时候，她倾向于提供显性的反馈；但是在和所有学生进行互动的时候，由于技术限制而无法提供及时的反馈。虽然参与调查的教师和学生对线上教学给课堂互动带来的影响有不同的看法，但是多数都认为线上教学背景下学生互动的有效性不如面对面的课堂教学理想。最后，文章根据二语习得理论对研究结果进行了进一步的讨论，并针对在汉语作为外语教学情境下如何更好开展线上教学也提供了一些建议。

关键词

线上网络教学，教师和学生的互动，学生之间的互动，汉语作为外语的教学

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