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A comparative study of perceptions and experiences of online Chinese language learners in China and the United States during the COVID-19 pandemic

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Abstract: This study compared the perceptions and experiences of 173 students studying Chinese as a foreign language in universities online during the COVID-19 pandemic in China and the United States. Controlling students' previous diversity of Chinese course delivery modes across countries and Chinese language levels, three two-way analysis of covariance (ANCOVA) were conducted to compare differences among three dependent variables: 1) satisfaction towards online classes; 2) self-perceived learning effectiveness online versus onsite; and 3) willingness to take a virtual Chinese course in the future. The results did not find statistical significances regarding students' satisfaction and willingness across countries and language levels. However, the results found students in the United States (US) viewed online classes as significantly less effective than learning in-person, which was different from the views of students in China. The Pearson correlation analysis indicated that there were positive correlations among these three variables. Pearson chi-squared tests found that, significantly, students in the US preferred to take Chinese courses in-person. Pearson's chi-squared tests on categories formed from the three open-ended questions highlighted the importance of four factors influencing the success of students' online classes: technology, emotion and motivation, learning productivity, and teaching presence. Pedagogical recommendations are discussed.

Keywords: Chinese language learners; COVID-19; online learning; perspective

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1 Introduction

According to a report by UNESCO, by May 13, 2020, schools in over 190 countries had closed due to the unprecedented COVID-19 pandemic, affecting 90% of the world's student population (Giannini, Jenkins, & Saavedra, 2020). During the spring 2020 semester, 98% of institutions in the US moved from in-person classes to an online format to prevent the rampant spread of coronavirus (Bustamante, 2020). Due to this urgent transition from in-person classes to online classes, both teachers and students encountered significant challenges in the online learning environment and, consequently, students' online learning results and experiences have been tremendously affected. As reported in a US national survey, more than 45% of students who participated in online learning during the pandemic did not learn as well as they did before the pandemic (Means & Neisler, 2020).

The pandemic also forced most instructors who teaching Chinese as a foreign language (CFL) to quickly move to online teaching. However, existing empirical studies on teaching and learning CFL online were not relevant enough to cope with the new challenges presented by the pandemic, as most of studies investigated issues based on specific courses (Stickler & Shi, 2013; Wang, 2012) or programs (Li & Jiang, 2017). There was a lack of large-scale survey studies exploring issues across institutions regarding teaching and learning CFL online before 2020.

The present research, through a large-scale survey, looked comparatively at how the two largest CFL sites, China and the US, reacted to the quick move to online teaching and learning during the pandemic. China, as the biggest CLF target language learning environment, had the largest body of CFL learners. According to a Chinese government statistical report, a total of 492,185 international learners from 196 countries/areas studied in China before the pandemic (Ministry of Education of China, 2019). The US is also one of the western countries that has attracted many students to learn CFL. Even during the pandemic, the US had the most CFL learners, as shown in Duolingo's *2020 Chinese Language Learning Report* (Xiang, 2020). Comparing how CFL learners in China and in the US perceived the urgent online experience will be meaningful to other Chinese language educators and learners.

Since the current literature lacks studies comparing the teaching and learning of CFL online including various countries, like China and the US, the present research aims to contribute to the field by investigating CFL learners' satisfaction, learning effectiveness, and willingness based on their online learning at the beginning of the COVID-19 pandemic in China and the US. The findings from this research will guide CFL instructors in designing high-quality online classes to the best extent possible. It also provides valuable insights for curriculum designers,

program directors, researchers, and practitioners in Chinese online course design and curriculum development.

2 Literature review

This study focused on a comparison of students' perceptions and experiences of online CFL learning. Therefore, we first draw on the literature regarding frequently discussed aspects concerning students' online learning: technology, interaction, learning effectiveness, and psychological aspects, especially emotion and motivation. Then, we discuss online CFL teaching and learning during COVID-19 pandemic.

2.1 Technology and online learning experiences

The advancement of technology has boosted distance education capabilities, which have been shown to be of substantial benefit during emergencies when the regular education process is interrupted, such as by natural disasters like earthquakes, hurricanes, or floods (Dhawan, 2020). Amid the ongoing COVID-19 pandemic, online education has been necessary for students in most countries to continue learning. Studies on students' satisfactions with online learning experiences during the COVID-19 pandemic have found that technological issues, such as internet service, accessibility, and stability, were the most critical elements affecting learners' online learning satisfaction and outcomes (Aboagye, Yawson, & Appiah, 2020; Hasan & Khan, 2020; Yan et al., 2021). Other large-scale survey studies with college and high-school students in the US (Wess, 2020) and college students in South Korea (Shim & Lee, 2020) revealed that internet instability was one of the top reasons for dissatisfaction with online learning and even caused lower grades. Overall, the unreliability of internet connections was the main technological challenge during the pandemic (Ferri, Grifoni, & Guzzo, 2020).

Besides internet stability, when examining technology in online education, a broad consensus is that the use of the technological tools highly positively associated with the students' satisfaction with online learning (Dorand, 2020). When technology tools, like Quizlet and Kahoot, are pedagogically used to assist in instructional process, they have been shown to engage students, bridge communication gaps across screens, increase interactions, and promote learning autonomy in the online learning environment (Vorobel & Kim, 2012). For example, Huang (2020) appropriately selected different tools based on specific teaching objectives and the Triple E framework (engagement, enhancement, and extension) in Chinese language

teaching and learning, which successfully improved students' interactions and enhanced both their synchronous and asynchronous learning.

2.2 Emotions and motivation in online learning

Emotions are closely associated with students' motivation, learning strategies, cognitive resources, self-regulation, and academic achievement (Pekrun, Goetz, Titz, & Perry, 2002). Positive emotions (e.g., enjoyment, hope, pride, and relief) subsequently predict positive learning achievements. Negative emotions (e.g., anger, anxiety, shame, and boredom) predict negative learning outcomes (Pekrun, Lichtenfeld, Marsh, Murayama, & Goetz, 2017). Emotions have also been positively correlated with students' academic achievements in online environments, which demand an even higher degree of learning autonomy from students to organise, manage, and regulate their learning than typical in-person classroom environments. On the other hand, boredom has been negatively correlated with learning behaviours (Artino & Jones, 2012). When examining learning strategies along with the motivational perceptions and emotions of students, Marchand and Gutierrez (2012) established and tested their conceptual model to investigate the role of emotion in online and in-person sessions of research methodology courses. Their model revealed that hope, frustration, and anxiety predicted the different learning strategies used by students. Motivation is greatly affected by emotions and, consequently, influences students' learning (Selvi, 2010). If learning occurs with a positive attitude, students are more motivated to acquire and retain knowledge. Students with strong motivation in learning tend to have better self-regulated behaviours in online learning (Zheng, Liang, Li, & Tsai, 2018).

Emotions and motivational factors related to online learning have been more important and complicated amidst the COVID-19 pandemic. According to a US national survey (Bustamante, 2020), as of April 2020, the top concern of college and university presidents was students' mental health, rather than academic achievement. Many students' negative academic emotions were increasing due to many other psychological pressures caused by the pandemic's impacts on daily life and the economy. Emergency remote learning during the pandemic required a greater level of self-discipline, time-management skills, and motivation to perform well. However, because of a variety of psychological issues, 79% of students reported "staying motivated and doing well in the course" as a problem with online course participation (Means & Neisler, 2020); 76% of all undergraduates identified "lack of motivation for online learning" as the biggest obstacle; and 56% of graduate and professional students felt the same way (Owen, 2020). As well, when exploring the online learning of Chinese characters, Gao (2020) noted that learners'

mental health and wellbeing (motivation, self-discipline, and self-study) were the major challenges for students learning Chinese online.

2.3 Interaction and teaching presence in online learning

The importance of interaction in learning has been increasingly recognised in online education. Interaction is found to be a critical indicator of student satisfaction (Baber, 2020; Kuo, Walker, Schroder, & Belland, 2014; Shim & Lee, 2020). Comparing students' willingness to take in-person or online classes, 92% of students preferred in-person instruction due to the lack of interaction in online classes (Tichavsky, Hunt, Driscoll, & Jicha, 2015). The effective use of technology tools can facilitate online interactive learning activities to enhance foreign language and culture competence. This was shown by Huang (2020) in her online Chinese class where she applied multiple tools (Classkick, Slack, Flipgrid, etc.) and successfully enhanced all four types of interaction: student and interface, student and content, student and teacher, and student and student.

In addition, online interactive activities have been shown to benefit the learning of Chinese characters, which is a unique aspect of online Chinese teaching and learning. Some students have underperformed in character learning in the online setting (Sun, 2011), but other students have had very positive learning experiences because the instructor adopted more online interactive tools—for example, interactive whiteboards, screen sharing, and other types of multimedia resources (Zhao et al., 2020).

Furthermore, interactions can be facilitated with online teaching presence, which is another critical factor that has moderately strong correlation with students' perceived learning and satisfaction (Caskurlu et al., 2020). Teaching presence is defined as “the design, facilitation, and direction of cognitive and social processes for the purpose of realising personality meaningful and educationally worthwhile learning outcomes” (Anderson, Rourke, Garrison, & Archer, 2001, p. 5). It is illustrated in three dimensions in online learning: design and organisation, facilitating discourse, and direct instruction (Garrison, Anderson, & Archer, 2001). Students who reported higher levels of the three dimensions in teaching presence also reported higher levels of satisfaction and perceived learning in a large-scale study (Shea, Fredericksen, Pickett, & Pelz, 2003). Online students who had strong perceived teaching presence were also more satisfied working in their groups (Stein, Wanstreet, Calvin, Overtom, & Wheaton, 2005). Therefore, instructional support and teaching presence were highly valued by students as important factors of online learning (Wart et al., 2020).

2.4 Learning effectiveness in online language learning

The literature has shown that regarding the effectiveness of online language learning, compared to the traditional classroom, there was no superiority nor significant differences in the instructional delivery format (Gacs, Goertler, & Spasova, 2020; Hockly, 2015; Montiel-Chamorro, 2018). Regardless of teaching delivery format, the ultimate goal of teaching “should keep learning as effective as possible to engage students in learning on a deeper and more meaningful cognitive level” (Qing & Diamantidaki, 2020, p. 58). As when teaching in-person classes, when teaching a foreign language online, instructors must focus on the development of four language skills: the receptive skills of listening and reading and the productive skills of writing and speaking (Yuce, 2019).

2.5 Online Chinese teaching and learning during the COVID-19 pandemic

Although the COVID-19 pandemic has undoubtedly brought unprecedented challenges to Chinese language teaching and learning worldwide, the challenges have ultimately been turned into opportunities to conduct online learning experiments (Zimmerman, 2020). Driven by instructional practice, researchers were attracted to designing a pedagogically sound and beneficial online Chinese language course during the pandemic. The findings of the limited number of studies on teaching and learning Chinese during the pandemic covered various aspects, for example, teaching Chinese characters online (Gao, 2020; Y. Xu, Jin, Deifell, & Angus, 2021; Q. Zhang, 2020), teacher–student interaction (Qing & Diamantidaki, 2020), teachers’ beliefs about online teaching (C. Zhang, 2020), comparison between in-person and online Chinese classes (Zhao et al., 2020), case studies investigating students’ online experience based on the data from one university (L. Xu, Chen, & Shi, 2021), K–12 teachers’ perceptions on online teaching (Ren, 2020), and emergency Chinese curricula (Wang & East, 2020). Few studies surveyed CFL students across institutions and regions, although the importance of understanding student perceptions and experience has been widely acknowledged in education practice and research (e.g., Kim, Liu, & Bonk, 2005).

In summary, through the literature review, four aspects of online learning—technology, interaction, learning effectiveness, and psychological aspects (emotion and motivation)—were identified as essential elements of the quality of online instruction and learning experiences. These elements provided a foundation for the present research and thus practical implications for designing and

delivering quality Chinese language courses online. Meanwhile, the literature review also found research gaps in 1) comparing the perceptions and experiences of CFL learners studying Chinese online in universities in China and the US, and 2) large-scale surveys on students' experiences of learning CFL online during the pandemic. The present study expected to fill in the gaps in the literature by comparing China and the US as areas study. Therefore, we proposed following three research questions:

- 1) Were there differences regarding the satisfaction, learning effectiveness, and willingness of taking future online Chinese courses between the CFL students at the universities in China and the US at the beginning of the COVID-19 pandemic?
- 2) Were there differences in what students liked and disliked the online Chinese courses between the CFL students at the universities in China and the US at the beginning of the COVID-19 pandemic?
- 3) Were there differences in problems encountered in online learning between the CFL students at the universities in China and the US?

By exploring these research questions, this pioneering study will help Chinese instructors obtain a deeper understanding of online Chinese language courses from students' perceptions by examining students in China and the US as representative examples. Further, we expect that this study will offer a factorial framework for online CFL teaching and learning that provides practical implications for Chinese language instructors in designing and delivering high-quality online Chinese language courses and in meeting students' needs and improving their language proficiency to the best extent possible.

3 Methodology

3.1 Data collection

This study adopted the secondary data analysis (SDA) approach to analyse the existing and primary data collected by the researchers (Donnellan & Lucas, 2013). The SDA approach has been widely used in many subjects, such as nursing science (Szabo & Strang, 1997), psychology (Donnellan & Lucas, 2013), social work (Sales, Lichtenwalter, & Fevola, 2006), and other social sciences (Vartanian, 2011). This approach allows the researchers to analyse the existing data from a previous study collected by the same researchers or others to “explore new questions” or “use different analysis strategies” (Ruggiano & Perry, 2019, p. 82).

The primary database used in this study was a large-scale world survey to investigate the perceptions and experiences of Chinese learners conducted in spring 2020 during the COVID-19 pandemic and developed by the researchers of this study. The questionnaire (Liu, Wang, & Zhan, 2022) consisted of four sections and 21 questions related to students' technological tool use, learning experience, satisfaction, preference, online interaction, learning effectiveness, problems, strategies, etc. The primary data were collected between late April and September 2020 and consisted of 461 responses from students at universities and colleges in 24 countries. Among them, 37% of the responses were from US and Chinese students, which ranked as the top two in terms of sample size.

The current study extracted the following variables from the primary database: country, language levels, online learning effectiveness, online satisfaction, willingness to take a fully online Chinese course in the future, preference of taking different modes of Chinese courses in the future, and diversity of previous Chinese course modes (see Appendix I for the description of the variables). We also coded the students' responses to the three open-ended questions in the primary data: 1) what problems have you encountered in learning Chinese online? (hereafter referred to as "Problem"); 2) please share 1–3 things you like the most about learning the Chinese language online (hereinafter referred to as "Like"); and 3) please share 1–3 things you dislike the most about learning the Chinese language online (hereinafter referred to as "Dislike").

3.2 Participants

The current research screened out 173 students who studied Chinese in the US or China from the database to meet our research purpose. Among them, 118 students (67.8%) were in the US, and 55 were in China (31.6%). Around 99.2% of the students in the US studied Chinese language at a four-year university/college, compared to only 54.5% in China. About 47.5% of the students in the US were at a beginner level, compared to only 14.5% in China. More students in China were at an intermediate level (58.2%) or advanced level (25.5%) compared to students in the US (intermediate 29.0%, advanced 11.9%). Among US students, 60 were females (50.8%) and 29 (24.6%) were males. Among the students in China, 18 (32.7%) were females and 23 (41.8%) were males. The age of the students in the US ranged from 18 to 36 years with a mean of 20.43 years and in China ranged from 20 to 40 years with a mean of 26.02 years (see Table 1).

Table 1: Demographic information of students in the US and China.

		US		China	
		<i>N</i>	%	<i>N</i>	%
Institution	Four-year university/college	117	99.2%	30	54.5%
	Two-/three-year university/college	1	0.8%	15	27.3%
	Other	0	0%	10	18.2%
	Total	118	100%	55	100%
Chinese language level	Beginning level	56	47.5%	8	14.5%
	Intermediate level	46	29.0%	32	58.2%
	Advanced level	14	11.9%	14	25.5%
	Other	2	1.7%	1	1.8%
	Total	118	100%	55	100%
Gender	Male	29	24.6%	23	41.8%
	Female	60	50.8%	18	32.7%
	Missing data	29	24.6%	14	25.5%
	Total	118	100%	55	100%

3.3 Data coding

Two researchers coded the responses to the three open-ended questions. They first coded 10 answers together as the subject training, and then coded all responses independently with the inductive coding method to ground the themes. If one response consisted of the statements fit to more than one theme, they were coded into multiple themes. For example, “too many distractions and problems such as Wi-Fi connection” was coded into two themes: “Distraction” and “Technology Reliability.” Next, the two reviewers crosschecked whether the themes formed were discrete and independent to finalise the themes. Then, the reviewers recoded the data independently into the new themes. The interrater reliability κ coefficient reached 0.86, which was viewed as excellent agreement. If any discrepancy in coding occurred during the rechecking process, the reviewers reinterpreted and justified the coding theme. Each theme was viewed as a variable: if students mentioned a component of a theme in their answer, “1” was coded; if not, “0” was coded. The categorical dataset was finally ready for analysis.

3.4 Data analysis

After extracting all valid data mentioned above from the database and performing coding, we first computed the Pearson correlation coefficients to examine the

relationships among the three variables (satisfaction, learning effectiveness, and willingness) without distinguishing countries. Then, using two-way analysis of covariance (ANCOVA), we analysed the three dependent variables—satisfaction, learning effectiveness, and willingness—by controlling the diversity of previous course modes across countries and Chinese language levels. Next, we conducted two Pearson chi-squared tests. One was to examine the associations of countries and students’ preferences for taking four modes of Chinese courses in the future. Another was to examine the associations between countries and different themes in the three open-ended questions.

4 Results

4.1 Students’ satisfaction, learning effects, and willingness to take future online Chinese courses

The Pearson correlation analysis (see Table 2) found a moderately positive correlation between satisfaction and willingness among all students, $r = 0.53$, $n = 155$, $p = 0.00$ (2-tailed); a weak positive correlation between satisfaction and learning effectiveness among all students, $r = 0.32$, $n = 155$, $p = 0.00$ (2-tailed); and a weak positive correlation between perceived learning effectiveness and willingness among all students, $r = 0.38$, $n = 155$, $p = 0.00$ (2-tailed).

Next, two other Pearson correlation analyses were performed, using students either from the US or China as a sample, which showed that among students in the US, there was a moderately positive correlation between satisfaction and willingness, $r = 0.46$, $n = 105$, $p = 0.00$ (2-tailed); a weak correlation between satisfaction and learning effectiveness, $r = 0.37$, $n = 105$, $p = 0.00$ (2-tailed); and a weak correlation between learning effectiveness and willingness, $r = 0.34$, $n = 105$,

Table 2: Pearson correlation analysis among satisfaction, learning effectiveness, and willingness.

	Satisfaction	Learning effectiveness			Willingness		
		Both	US	China	Both	US	China
Satisfaction		0.32 ^a	0.37 ^a	0.33 ^a	0.53 ^a	0.46 ^a	0.66 ^a
Learning effectiveness					0.38 ^a	0.34 ^a	0.47 ^a
Willingness							
N		155	105	50	155	105	50

^aCorrelation is significant at the 0.01 level (2-tailed).

$p = 0.00$ (2-tailed). Taking students in China as a sample, there was a strong positive correlation between satisfaction and willingness, $r = 0.66$, $n = 50$, $p = 0.00$ (2-tailed); a weak correlation between satisfaction and learning effectiveness, $r = 0.33$, $n = 50$, $p = 0.00$ (2-tailed); and a moderate correlation between learning effectiveness and willingness, $r = 0.47$, $n = 50$, $p = 0.00$ (2-tailed).

The above results revealed that regardless of students' country, students who perceived higher online learning effectiveness felt more satisfaction with online learning. Additionally, students who were more satisfied with online learning would be more willing to take a fully online Chinese course in the future. This predication was much stronger among students in China than in the US.

A two-way ANCOVA was conducted to examine the differences among students' satisfaction regarding online classes during the COVID-19 pandemic by controlling the diversity of their previous Chinese course modes across country and language levels. There were no significant results found on the main effect of country, [$F(1, 121) = 0.30$, $p = 0.59$], language level, [$F(2, 121) = 0.95$, $p = 0.39$], or the interaction of country and language level, [$F(2, 121) = 2.08$, $p = 0.13$] (see Table 3). The results indicated that regardless of country or language level, excluding the influence of students' previous experience taking various Chinese language courses, students in both countries showed the same satisfaction towards their online classes during the COVID-19 pandemic.

Table 3: Data of satisfaction.

Satisfaction	US			China		
	Beginning	Intermediate	Advanced	Beginning	Intermediate	Advanced
<i>M</i>	3.62	3.77	3.08	2.80	3.52	3.70
<i>SD</i>	1.09	1.14	1.08	1.30	1.30	1.06
<i>N</i>	37	39	12	5	25	10

Another two-way ANCOVA was conducted to compare the difference of online learning effectiveness compared to onsite learning, by controlling the diversity of students' previous Chinese course modes across countries and language levels. The results did not show significance of the main effect of language level, [$F(2, 121) = 0.12$, $p = 0.89$] or the interaction of country and language level, [$F(2, 121) = 0.28$, $p = 0.76$]. However, the significant main effect of country was found, [$F(1, 121) = 4.60$, $p = 0.03$, $\eta_p^2 = 0.04$] (see Table 4).

We conducted a one-way ANOVA to examine the differences between learning effectiveness online and onsite among students in the US and China. A significant result revealed that compared to onsite learning, online learning effectiveness from the students in the US ($M = 1.99$, $SD = 0.81$) was significantly lower than in

Table 4: Data of learning effectiveness.

Learning effectiveness	US			China		
	Beginning	Intermediate	Advanced	Beginning	Intermediate	Advanced
<i>M</i>	2.00	1.90	2.08	2.6	2.52	2.30
<i>SD</i>	0.78	0.75	0.75	1.82	1.30	1.16
<i>N</i>	37	39	12	5	25	10

China ($M = 2.58$, $SD = 1.34$), [$F(1, 154) = 11.57$, $p = 0.00$, $\eta_p^2 = 0.07$]. This indicated that students in China viewed the online learning effectiveness the same as onsite, but US students thought they learnt less online.

The third two-way ANCOVA compared differences on willingness to take fully online classes in the future by controlling for students’ previous diversity of Chinese course modes across countries and Chinese language levels. The results did not show significance regarding the main effect of language level [$F(2, 121) = 0.12$, $p = 0.29$], country [$F(1, 121) = 0.33$, $p = 0.57$], or the interaction of country and language level [$F(2, 121) = 0.14$, $p = 0.87$] (see Table 5). Hence, regardless of country or language level and controlling for students’ previous experiences with Chinese classes, students in both countries shared the same preferences towards fully online Chinese courses in the future.

Table 5: Data of willingness.

Learning effectiveness	US			China		
	Beginning	Intermediate	Advanced	Beginning	Intermediate	Advanced
<i>M</i>	3.39	3.38	2.75	3.4	3.48	3.11
<i>SD</i>	1.13	1.09	1.29	1.67	1.36	1.17
<i>N</i>	38	39	12	5	25	9

Pearson chi-squared tests were conducted to examine the relationship of country and preference regarding taking four types of Chinese courses. The result found that students in the US significantly preferred taking in-person classes in the future, $\chi^2(1, N = 173) = 8.92$, $p = 0.01$ (2-sided). There were no significant differences in results between countries and taking other types of Chinese courses (hybrid, synchronous, and asynchronous) in the future. The non-significant result regarding synchronous and asynchronous classes in the future resonated with the findings of the two-way ANCOVA regarding fully online courses in the future.

4.2 Most liked and disliked; problems encountered

We analysed students’ responses to the three open-ended questions regarding what they most liked and disliked in their online Chinese courses, as well as the problems they encountered online. Through the inductive coding of 382 student responses from 173 students, the following twelve themes emerged (see Table 6): 1) Flexibility, 2) Integration, 3) Technology Reliability, 4) Students’ Adaptability, 5) Attention, 6) Motivation, 7) Satisfaction, 8) Language Skills, 9) Interaction, 10) Learning Effectiveness, 11) Communication, and 12) Instruction. An explanation of each theme is provided in Appendix II, together with quotes of sample student responses.

To highlight the different representations of the themes in different questions, we added the positive or negative marks to the same themes to indicate either whether the students valued the themes positively or negatively in the online class (see Table 6).

As shown in Table 6 above, among the 12 themes, eight of them overlapped across the three questions. In addition, students liked the online courses because of their flexibility and integration of various technology tools and applications. Students disliked the online courses due to their bad technology reliability and lack of motivation in the online courses, two of which were also the problems they encountered.

Table 6: Themes that emerged from the three open-ended questions.

Themes in the “Like” question	Themes in the “Dislike” question	Themes in the “Problem” question
+Students’ Adaptability	–Students’ Adaptability	–Students’ Adaptability
+Language Skills	–Language Skills	–Language Skills
+Interaction	–Interaction	–Interaction
+Learning Effectiveness	–Learning Effectiveness	–Learning Effectiveness
+Communication	–Communication	–Communication
+Instruction	–Instruction	–Instruction
+Attention	–Attention	–Attention
+Satisfaction	–Satisfaction	–Satisfaction
+Flexibility		
+Integration		
	–Technology Reliability	–Technology Reliability
	–Motivation	–Motivation

“+” indicates the positive effect and “–” indicates the negative effect. For example, “–Attention” means that students reported decreased attention or lost focus in online study, while “+Attention” indicates that students reported increased attention or increased focus in online study.

4.2.1 Problems students encountered

To examine the associations between country and the themes in the “Problem” open-ended question, Pearson’s chi-squared tests were conducted, and the results indicated that there was a statistically significant association between country and “–Communication”—that is, significantly more students in China had problems communicating with their instructors online than those in the US, $\chi^2(1, N = 112) = 4.51$, $p < 0.05$ (2-sided). No significant results were found in the other themes.

We ranked the themes in the “Problem” question based on percent frequency (see Table 7) and found the primary problem in both countries was “–Technology Reliability” (45.0% in the US and 34.4% in China). Students in both countries had interaction issues (20.2% in the US and 28.1% in China) and adaptability issues (27.5% in the US and 15.6% in China) during online classes. Aside from these three problems, students in the US highlighted ineffective learning experiences (18.8%) and less motivation (16.3%) during their online learning, which were not cited as significant issues for students in China. However, more students in China stressed problems of online instruction (21.9%) and communication with their teachers (12.5%).

Table 7: Top 5 “Problem” themes based on countries.

US		China	
Themes	Percentage	Themes	Percentage
–Technology Reliability	45.0%	–Technology Reliability	34.4%
–Students’ Adaptability	27.5%	–Interaction	28.1%
–Interaction	20.2%	–Instruction	21.9%
–Learning Effectiveness	18.8%	–Students’ Adaptability	15.6%
–Motivation	16.3%	–Communication	12.5%

4.2.2 What students disliked most

Next, to examine the associations between country and the themes regarding the “Dislike” question, we performed Pearson’s chi-squared tests, and three significant results were observed in the themes of “–Interaction,” “–Students’ Adaptability,” and “–Language Skills.” The number of students in the US who could not adapt to online Chinese classes and, consequently, did not like online classes, was significantly higher than in China, $\chi^2(1, N = 135) = 7.43$, $p < 0.01$ (2-sided). The number of students who viewed the lack of interaction with their peers, tutors, teachers, and native Chinese speakers in the online classes as the reasons for their

dislike in the US was significantly higher than in China, $\chi^2(1, N = 135) = 6.35$, $p < 0.01$ (2-sided). The number of students in the US who disliked online classes because the online course hindered their improvement of their language skills, especially speaking, listening, and Chinese character handwriting, was also significantly higher than in China, $\chi^2(1, N = 135) = 8.11$, $p < 0.00$ (2-sided). No significant results were found compared to the other themes.

We ranked the themes in the “Dislike” question from high percentage to low percentage (see Table 8) and found that “–Interaction,” “–Instruction,” “–Students’ Adaptability,” and “–Technology Reliability” were the top four common reasons cited in both countries. Lack of interaction was top-ranked by the students in the US, but it was ranked the third among the students in China. Students in both countries ranked “Instruction” second because of instructors’ fast teaching pace, overloading of assignments, test setup, and disorganised instruction. More than 35% of students in both countries experienced technological issues—for example, unstable internet and sound problems. “–Technology Reliability” was the top-ranked reason in China, but the fourth among the students in the US. Of the students in China, 12.8% of students in China disliked the online courses because the students were not very motivated to take the online classes, but only 8.3% of the students in the US shared the same sentiment.

Table 8: Top 5 “Dislike” themes based on countries.

US		China	
Themes	Percentage	Themes	Percentage
–Interaction	40.6%	–Technology reliability	35.9%
–Instruction	40.6%	–Instruction	25.6%
–Students’ Adaptability	36.5%	–Interaction	17.9%
–Technology Reliability	35.4%	–Students’ adaptability	12.8%
–Language skills	34.4%	–Motivation	12.8%

4.2.3 What students liked most

To examine the associations between country and the themes regarding the “Like” question, Pearson’s chi-squared tests were conducted, and the results revealed that there were significant associations between country and “+Students’ Adaptability,” “+Interaction,” and “+Attention.” The students in the US liked the online Chinese classes significantly more because the features of online learning were well adapted to them compared to the students in China, $\chi^2(1, N = 135) = 5.67$, $p = 0.02$ (2-sided). The US students appreciated the online classes because of the

interaction with their peers, instructors, and native speakers significantly more than the students in China, $\chi^2(1, N = 135) = 4.71, p = 0.03$ (2-sided). However, the students in China agreed significantly more that less distraction was one of the reasons they liked the online courses compared to their counterparts in the US $\chi^2(1, N = 135) = 3.91, p < 0.05$ (2-sided). There were no statistical differences between country and the other themes.

All top five themes regarding the “Like” reasons (see Table 9) in both countries were the same: “+Flexibility,” “+Students’ Adaptability,” “+Integration,” “+Instruction,” “+Integration,” and “+Satisfaction.” The flexibility, students’ adaptability, and integration were the primary features of online classes favoured by students in both countries. More than 50% of students in both countries agreed that the flexibility of online Chinese courses was the top reason they liked the online classes. The students in both countries appreciated the online Chinese classes because of their teachers’ better online instruction practices and felt very satisfied with their online classes.

Table 9: Top 5 “Like” themes based on countries.

US		China	
Themes	Percentage	Themes	Percentage
+Flexibility	52.7%	+Flexibility	53.7%
+Students’ Adaptability	50.5%	+Instruction	33.3%
+Instruction	32.3%	+Students’ Adaptability	28.6%
+Integration	29.0%	+Satisfaction	28.6%
+Satisfaction	25.8%	+Integration	16.7%

Based on the analysis above, the 12 themes were grouped into four factors (see Table 10): technology, emotion and motivation, learning productivity, and teaching presence. The students liked the online courses due to the positive aspects of the four factors, technology features (e.g. flexibility, adaptability, and the integration of various tools in online classes), support of their emotions and wellbeing (e.g. increased confidence, less anxiety, more concentration, and satisfaction and comfort), learning productivity (e.g., easy to practice speaking, practice, and writing Chinese characters with the assistance of online tools; easy to do interactive activities online; and better learning effectiveness), as well as teaching presence (e.g., effective communication with teachers out of the classroom, adept online teaching instruction, reasonable assignments and workloads, and teachers’ active and positive attitude).

Table 10: Factors and themes for the three open-ended questions.

Factors	Themes in the “Like” question	Themes in the “Dislike” question	Themes in the “Problem” question
Technology	+Students’ Adaptability +Flexibility +Integration	–Students’ Adaptability –Technology Reliability	–Students’ Adaptability –Technology Reliability
Emotion and motivation	+Attention +Satisfaction	–Attention –Satisfaction –Motivation	–Attention –Satisfaction –Motivation
Learning productivity	+Language Skills +Interaction +Learning effectiveness	–Language Skills –Interaction –Learning effectiveness	–Language Skills –Interaction –Learning effectiveness
Teaching presence	+Communication +Instruction	–Communication –Instruction	–Communication –Instruction

“+” indicates the positive effect and “–” indicates the negative effect.

4.3 Summary

In conclusion, in both countries, better learning effectiveness and more satisfaction with online classes strongly predicted students’ willingness to take a fully online course in the future. The students in the US had a significantly worse online learning effectiveness versus onsite compared to students in China. The students in the US significantly preferred in-person classes in the future because of their unsatisfying online experience. More students in the US criticised the lack of interactive and communicative activities because they were not able to practice enough to develop their language skills. The reasons the US students liked the online courses were the online interactive activities and their adaptability to the features of online classes, for example, screen sharing and breakout rooms in Zoom.

Compared to students in the US, students in China thought their learning effectiveness online and onsite were the same. More students in China agreed that they did not have enough communication with their teachers for asking questions. Significantly different to students in the US, students in China liked the online classes because it increased their attention.

The results also showed that students in both countries did not show any differences in their satisfaction with online classes, willingness to take fully online classes in the future, and preferences for hybrid, synchronous, and asynchronous online courses. In contrast, more students in both countries showed satisfaction with online classes because of their experiences in adapting to online learning,

better teachers' instruction practices, the integration of tools and applications, and the flexibility of online Chinese classes. Generally, four factors—technology, emotion and motivation, learning productivity, and teaching presence—were the most important contributing factors of success in online learning.

5 Discussion and recommendations

5.1 Importance of technology for successful online learning

This study found that students' satisfaction with online classes and better learning effectiveness could positively predict students' willingness to take online Chinese classes, regardless of whether the students were in the US or China. Thus, it is critical to design quality online courses supported by technology to enhance students' satisfaction and improve their learning effectiveness.

Technology, including the Internet, software, apps, and digital tools, as infrastructure support is fundamental for online courses (Meyer & Barefield, 2010). It is a key factor identified in this study that impacted students' satisfaction with and learning effectiveness in online classes. The flexibility of technology-supported online learning allowed students to take online classes anywhere or anytime as self-paced or customised learning. Moreover, students highly valued other features of technology that effectively assisted their success in online learning, such as easy access to learning materials, stable and fast Internet connection, adaptable technology (e.g., recording, screen sharing, annotation, breakout Zoom, rooms), and versatile tools, like Kahoot and Quizlet.

On the other hand, worse experiences with technology in online learning could be seen as a disaster to students. As one student commented, *“either the Wi-Fi could go out or a website wouldn't work and the whole class would be derailed.”* This common technology problem in both the US and China not only interrupted smooth instruction, but also frustrated students. This finding resonated with the findings of Gao (2020) and Wang and East (2020). The urgent transition to online learning did not allow the instructors to become familiar with the technology, including Wi-Fi connection stabilisation, appropriate tools for delivering real-time meetings, and customised interaction tools; consequently, students were discomfited emotionally, had lowered learning effectiveness, and ultimately experienced undermined willingness to take online Chinese courses in the future.

5.2 Students' psychological responses to the online class

The factor “Emotions and Motivation” consisted of three themes: “Attention,” “Satisfaction,” and “Motivation.” Significantly more students in China agreed that the online mode increased their attention because there were “[n]o distractions from other classmates.” Only two students in the US stressed increased focus. In contrast, nearly 18% of students in the US complained that their attention was easily distracted in online classes, which was attributed to being “*at home*” “*staring at a screen all day*” and experiencing “*technical difficulties*.” However, only two students in China shared the same complaints.

Regarding attention distraction, the students in China were not easily distracted by their peers online; inversely, the students in the US were more distracted by their home environments, and unreliability of technology. We postulated that a student's age, motivation, and the length of learning Chinese could account for the differences. The average age of the students in China was nearly six years older than the students in the US. Most of the students in the US were at the beginner level (47.5%), but 58.2% of students in China were at the intermediate level. Generally, the older students are, the better their capacity for controlling their concentration is, since the students have stronger motivation in the target language environment than learning a foreign language at home (Hernández, 2010). The students in China might generally have stronger motivation than those in the US, which can be glimpsed from the statement of a student in China: “[B]ecause we [are] from Pakistan and in our country a lot of projects [doing] by Chinese engineer[s] and worker[s] so it's help us to earn money as a translator.”

Motivation has a positive correlation with students' achievement (Masgoret & Gardner, 2003). Due to the pandemic, students in both the US and China had to take online classes involuntarily, which likely resulted in the observed decreased motivation. As students commented, “*the motivational factor of being in a classroom is gone*,” so they cannot “*use [Chinese language] for anything practical*.” Because of “*lack of face-to-face interaction*,” as students reported, “*I felt that my general expectations for the class and for my own performance decreased, which caused me to struggle with my own motivation*.” The decreased motivation in the online Chinese classes predicted the unsatisfactory performance in the Chinese language online classes. The students' psychological responses of lack of attention and motivation in the online Chinese classes set up a warning line for future online courses and curriculum design. It reminded the instructors to apply interactive and attractive activities in their online courses to maintain students' attention and motivation (Esra & Sevilen, 2021).

5.3 Interaction and teaching presence in the online class

The vital importance of the interaction in the interaction hypothesis (Long, 1981) has been widely accepted and applied in the practice of foreign language teaching. Well-designed interactive activities in online courses have even been claimed to be the primary predictor of academic retention (Rienties & Toetenel, 2016). The dynamics of interactions with peers, teachers, and native speakers in and out of the classroom engage students in meaningful communication in the target language, allow students to notice their input, receive the correct feedback, modify their output, and ultimately improve their foreign language proficiency (Ellis, 2008). The highly involved interaction of Chinese language learners is key to motivation, achievement, and a sense of belonging for students in an online course (Wang & East, 2020).

However, interactions with teachers and peers in Chinese language became the main shortcomings of online Chinese classes during the COVID-19 pandemic (Wang & East, 2020). In our study, the students in the US perceived significantly less learning effectiveness versus onsite than students in China. Significantly more students in the US disfavoured online classes and merely hoped to take Chinese courses in-person in the future. The reasons for this inclination were blamed on the lack of interaction with peers, teachers, tutors, and Chinese native speakers and less improvement of their Chinese language skills, especially speaking, listening, and memory of Chinese characters.

As long as the students in the US received satisfactory interactive activities in their online Chinese classes, they claimed their satisfaction, as one student mentioned “*The online classes had a lot of interaction, which I thought was good.*” Clearly, designing effective interactive online activities by using appropriate applications and technology tools could direct students’ learning effectiveness and laid the sound foundation on the successful online Chinese language classes.

5.4 Online Chinese character learning

This study revealed some unexpected findings about learning Chinese characters online. Chinese characters have always been viewed as the most difficult part of learning Chinese (Kan, Owen, & Bax, 2018). During the pandemic, the conventional handwriting activities changed to typing characters on screens. Similar to Gao’s (2020) findings, the students in this study did not share many complaints

about handwriting Chinese characters. Only about 7% of students in the US and 3% in China commented on lacking practice handwriting Chinese characters. It is “[h]ard to practice writing since everything is online,” so they “forgot how to write characters” and had “decreased motivation to memorise all of the characters.” But students’ attitude towards learning to write the Chinese characters was also bifurcate like the findings in Wang and East’s (2020) study. There were still about 4% of students in the US favouring typing Chinese characters, because “typ[ing] Hanzi, is significantly faster than writing them out” and “allows [students] to spend more time on learning grammar structures.”

Typing Chinese characters involves a higher level of recognition in the long-term memory to distinguish the homophones of different Chinese characters. Typing a correct character requires the accurate association of the phonological, semantic, and orthographic elements. In addition, typing Chinese characters could also effectively examine students’ memory of Chinese characters through their typographic errors. Besides typing characters, the students also commented that the well-prepared and forward-looking teachers who “showed some online stroke order tool for us” and acclaimed “that’s cool.” This study highly recommends stressing the typing of online characters and the incorporation of multimedia and animation to facilitate online Chinese learning, especially animation to demonstrate a character’s stroke order and the use of digital pens to practice handwriting on screen (Q. Zhang, 2020).

5.5 Recommendations for future online Chinese course design

Online foreign language courses could engage students “in an authentic language learning experience at a distance, often from the comfort of their home or workplace, with an opportunity for speaking and listening practice as well as to provide an immersive experience of the culture of the target language” (Rienties, Leweis, McFarlane, Nguyen, & Toetene, 2018, p. 275). However, teaching foreign language online in the pandemic is neither coherent nor sustainable to teachers’ development and the provisional teaching practices did not reflect research-based findings and recommendations (Paesani, 2020).

Pedagogically sound course design is critical for the success of online learning courses. Student need-driven designs strongly predict students’ behaviours and performance in online courses (Rienties et al., 2018). Based on this study, we highly recommend that foreign language teachers consider the four factors—technology,

emotion and motivation, learning productivity, and teaching presence—that lay the foundation of a framework for designing online language courses.

Technology is ultimately important for the successful delivery of content and to bridge various types of interaction (e.g., instructor and students, students and students). Poor internet connections and unreliable technology not only interrupt the teaching pace, but they also cause students' emotional undulation. At the beginning of an online course, it is key for teachers to check the internet connection and test the applications and software, as well as to give students time in advance to test their own devices and connections.

Although it is difficult to sense students' emotional changes online due to the physical isolation, students' negative emotions and motivations cause problems in learning. An attentive teacher can encourage and motivate students to keep learning and give them more positive emotional supports and feedback. Designing online courses to focus on improving students' language proficiency is also worth significant attention. Besides the interactive activities for oral practice, instructors must devote attention to designing online activities for learning Chinese characters—for example, the demonstration of stroke orders by animations and screen-pen writing activities to simulate handwriting.

The findings of our study recommend that instructors give students timely feedback, keep students in contact even out of class (e.g., online office hours, e-mail, etc.), structurally organise the instruction, diagnose students' problems, reasonably set up test and assignment due dates, as well create a friendly and harmonious online learning community. As Hockly (2015) reported, instructors should observe the unique affordance of the learning environment, discover how current technology can better support online learning, how to increase learning engagement and interaction, and how to design online learning activities to maximise the best affordance of the online learning environment.

6 Conclusions and limitations

Adopting the SDA approach, this study compared the experiences and perceptions of students studying Chinese online in China and the US at the beginning of COVID-19 pandemic. This study contributed a grounded framework for online course design, which included four important factors: technology, emotion and motivation, learning productivity, and teaching presence. When designing the online Chinese courses, our Chinese instructors must understand students'

emotional and mental demands, have the online pedagogical competence to teach online effectively, and facilitate interactive online activities with the supports of a reliable technology environment and versatile technology accessibility.

As a catalyst for revealing the differences between students learning Chinese in China and the US, this study shed light on conducting comparative area studies in the future. We hope it will benefit future Chinese online course implementation and provide valuable insights for curriculum designers, program directors, researchers, and practitioners in Chinese online course design and curriculum development. In addition, this study is a pioneer work for applying SDA in the field of language education research. We hope this study will inspire other researchers to adopt SDA in a wider research context.

As an SDA study, this research has limitations. First, due to the limited variables in the primary database, we could not acquire more data for deeper comparison, such as students' home countries, goals of learning Chinese (degree vs. non-degree), majors, and motivations. By adding these variables into the analysis, we could generate more valuable findings. Second, the sample in the primary database did not present the full-fledged samples of students studying Chinese in other countries. A bigger sample with diverse countries in future studies could examine the findings of this study. To complete a full and in-depth comparison study of student online learning experiences, a more focused survey instrument is needed, ideally including follow-up interviews. We also recommend a longitudinal study to compare online experiences and perceptions, as the data collected in this study was only from a limited span of time.

Appendix I: The description of the variables used in the study

1. Country: The countries where the student was studying Chinese language in Spring 2020.
2. Language levels: The level of Chinese language course that the student was taking in Spring 2020, e.g., beginning, intermediate, or advanced.
3. Learning effectiveness: Students' self-perceived learning effectiveness compared to onsite classes (5-Liker scale).
4. Satisfaction: Students' satisfaction towards online Chinese learning during COVID-19 (5-Liker scale).

5. Willingness: Students' willingness to take a fully online Chinese course in the future (5-Liker scale).
6. Preference: Students' preferences of taking in-person, hybrid, synchronous online, or asynchronous online Chinese courses in the future. It was coded as four categorical variables. Where 0 = no, 1 = yes.
7. Diversity: Students' previous experience of taking different modes of Chinese courses, in-person, hybrid, synchronous online, or asynchronous (an interval variable).

Appendix II: The twelve themes grounded from the three open-ended questions

Categories	Explanation	Samples of Students' Responses
1. Flexibility	The feature of online learning, such as no time and physical location limitation, self-paced learning, easy materials access, etc.	Positive responses: "More flexible in time and place"; "I can learn more at my own pace".
2. Integration	The feature of online learning which allows the versatile tools and apps integrated into the online class, like Quizlet, WeChat, Gimkit, Kahoot, VoiceThread, etc.	Positive responses: "Technology made it more convenient to keep all my learning materials (dialogues, vocab lists, etc.) in one place"; "I felt the integration of technology made learning and absorbing information much easier".
3. Technology Reliability	The function and operation of internet and technology	Negative responses: "Zoom sometimes kicks me out for no reason, Wi-Fi connection can't deal with large streaming"; "Glitches/freezing screen"; "Various technical problems (connection cutting out, lack of sound, background noise)".
4. Student Adaptability	The students' adaption to the online learning environment comparing to the onsite class and the features of online learning	Negative responses: "It was hard to replicate learning the language in class, where we could easily learn something from the teacher, then turn to our peer next to us and practice speaking what we just learnt. There's no natural feeling"; "It felt less personal and more isolating than a face-to-face classroom setting".

(continued)

Categories	Explanation	Samples of Students' Responses
5. Attention	The students' focus, attention, or distraction	Positive responses: "We can share our screens so everyone can see a PowerPoint or video right in front of them"; "Break-out rooms in ZOOM"; "Gets you adapted to some situations of life"; "not much different from learning in real life". Negative responses: "Difficult to stay focused"; "It is a little easier to become distracted while on-line learning". Positive responses: "You are able to focus more perhaps (less distractions perhaps)"; "Fully concentration".
6. Motivation	The students' motivation in the on-line class	Negative responses: "I am being too lazy"; "Decreased motivation to do work/study or learn outside of class meeting time"; "The motivational factor of being in a classroom is gone".
7. Satisfaction	The students' general emotional attitudes towards the online class, including anxiety, confidence, comfort, mental fatigue, etc.	Negative responses: "I simply don't like it"; "Sometimes boring"; "Eye strain from using my phone too much"; "Because of anxiety that has intensified due to COVID-19 and online classroom, it's harder for me to get to class which means I often fall behind". Positive responses: "Increases my self confidence"; "Fun"; "Learning online Chinese was good experience".
8. Language Skills	The Chinese language skills including speaking, reading, listening, writing, Chinese characters, grammar, etc.	Negative responses: "My listening and speaking DIDNT improve"; "Pronunciation can be difficult but hard to reinforce alone"; "I found it's hard to practice my Chinese character writing".

(continued)

Categories	Explanation	Samples of Students' Responses
9. Interaction	The interactive and communicative activities aiming to practice Chinese language	Positive responses: “Still being able to have speaking practice with peers”; “Being able to type the characters allows me to spend more time on learning grammar structures”. Negative responses: “Teaching is not interactive”; “Fewer interactions between students and teacher-students.” Positive responses: “The online class more interactive and fun”; “The online classes had a lot of interaction, which I thought was good”.
10. Learning Effectiveness	The general comments on learning effect without pointing out any specific skill	Negative responses: “I felt like I didn't understand anything”; “It's harder to comprehend and learn the material”; “I think I learn less in class”; “Overall difficulty of learning remotely”. Positive responses: “I love how much it challenged me to grow and develop”; “Working harder makes you remember the language”.
11. Communication	The communication with teachers in and out of class asking for questions related to the class	Negative responses: “No time to approach teacher in or after class”; “Communication barriers when attempting to ask a question that is not understood, and then normally goes unanswered”. Positive responses: “It seems easier to set up an appointment with teachers”; “Office hours are very convenient”; “Constant communication with teacher”.
12. Instruction	The teachers' online instructional practice, including pace, feedback, organisation, capability to diagnose students' problem, homework, test, etc.	Negative responses: “Feeling rushed to pronounce words”; “I didn't like the tempo and thought it was fast paced, I thought the workload was heavier than most classes.”; “It was easy to lose track of assignments”; “The format of our written

(continued)

Categories	Explanation	Samples of Students' Responses
		tests was changed to an online format"; "Teacher doesn't really want to teach"; "No immediate feedback". Positive responses: "The teachers are very dedicated"; "Having more flexible requirements to get homework done"; "Our teacher prepared the classes very well".

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