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Article

Australian Students' Perceptions of the Challenges and Strategies for Learning Chinese Characters in Emergency Online Teaching

Xiaoping Gao
University of Wollongong, Australia

Abstract
This study examines Australian students' perceptions of the challenges and strategies for learning and teaching Chinese characters in emergency online teaching amid the Covid-19 pandemic. Forty students at an Australian university completed an online survey. Results show that the students' perceived difficulties of learning characters in remote delivery were different from those reported in a face-to-face mode of learning. It seems that the implemented teaching strategies and revised assessment requirements have mitigated the challenges for learning characters. However, students reported some new challenges faced in emergency remote learning, such as technological and physical barriers (e.g., internet issues and learning space) and demands for self-discipline and time management abilities, which in turn affected their mental health and motivation for learning. The majority of students believed that repeated practice in the use of a variety of resources provided was effective in developing their character writing and reading skills. The majority also indicated their overall satisfaction with the implemented teaching strategies and their learning progress, although a few students reported their performance was affected by technological and physical constraints and shortage of time. Findings suggest that appropriate teaching strategies associated with research-based curriculum design should be implemented in online teaching to reduce students' stress and facilitate learning outcomes. Findings contribute to the theoretical development of character learning strategies by providing empirical evidence in emergency online teaching. This study has significant pedagogical implications for Chinese character pedagogy as proposed teaching strategies will be highly beneficial for instructed character learning in an online mode. This study also provides insights and suggestions about how Chinese language professionals and practitioners can improve on material and resource development and assessment design to adapt to future trends in online teaching.

Keywords
Perceptions, strategies, characters, Chinese as a foreign language, emergency online teaching

Address: Room 19. G100G, Faculty of the Arts, Social Sciences, and Humanities, University of Wollongong, NSW 2522, Australia
Email: xiaoping@uow.edu.au

1 Background

The rapid spread of Covid-19 worldwide in early 2020 has posed unprecedented challenges, not only to global economics, public health, and social interaction, but also to the means of communication and education within academia. Amid the Covid-19 pandemic, educational institutions worldwide expeditiously transitioned to remote delivery to cope with the social distancing requirements or unexpected lockdown. With the advent of Covid-19 control measures at the beginning of the Australian academic year, Australia's universities overhauled their course delivery and rapidly moved courses online as part of national efforts to slow community transmission of Covid-19. In March, more than half of the country's 41 universities shifted wholly or substantially to remote delivery of their courses (Johnston, 2020). Virtual classes have become the new norm. However, remote delivery has posed new challenges to some disciplines, including foreign language education in which face-to-face interactions are essential. The field of teaching Chinese as a second/foreign language (TCSL/TCFL) is among the many affected by the pandemic. In response to the emergency requirements, the majority of CSL/CFL programs around the world swiftly moved face-to-face classes online. The unexpected and precipitate transition to online teaching has increased challenges for teaching certain content or developing certain skills, challenges which were already difficult enough to overcome in face-to-face instruction. Developing L2 learners' Chinese character reading and handwriting skills is one of the more daunting tasks in TCSL. Most importantly, there are no readymade solutions available for teachers and learners to cope with the new challenges in this emergency situation.

To meet this pressing need, the current study investigates Australian students' perceptions of the challenges and strategies for learning Chinese characters and their satisfaction with the teaching strategies implemented in emergency online delivery. This study not only reflects on the changes in teaching and learning caused by unprecedented challenges in the Covid-19 pandemic, but also provides solutions that cater to the needs of Chinese language practitioners and course providers on how to deal with challenges in learning characters. Findings will contribute to the theoretical development of character teaching and learning strategies by providing empirical evidence in emergency online teaching. This study has significant pedagogical implications for Chinese character pedagogy as the implemented character teaching strategies will be highly beneficial for teaching and learning characters in an online mode. This study also offers insights and suggestions about how Chinese language professionals and practitioners can improve in material and resource development and assessment design to adapt to future trends in online teaching.

2 Literature Review

2.1 L2 Learners' strategies for learning Chinese characters

Chinese characters are the basic reading and writing scripts of the Chinese language. Chinese is a logo-phonetic or logographic language, meaning that each script represents both meaning and sound. Chinese is the most widely used language worldwide by the number of users. With the prevalence of technology, Chinese internet users have amounted to approximately 904 million solely in China as of the first quarter of 2020 (Thomala, 2020). Nevertheless, Chinese characters are often perceived as one of the most difficult components of the language by learners of Chinese as a foreign/second language (CFL/CSL), especially those with alphabetic first-language (L1) backgrounds (Everson, 1998; Ling, 2007; Yin, 2003). Due to its linguistic significance and difficulties for learning, character teaching and learning have received considerable attention in CFL/CSL research since its onset. To date, more than one hundred articles have been published in English or Chinese to probe this topic. The empirical studies that examined character teaching (e.g., Everson, 2011) and learning strategies (e.g., X. Jiang & Zhao, 2001; Shen, 2005; Sung, 2014; Yin, 2003) are mainly based on the data collected from CFL learners in the US

or CSL learners in China. Yet, little research has explored character teaching or learning strategies in the Australian context. This partially motivated the current study.

Empirical studies into character learning strategies depict a "snapshot" of the strategies that L2 learners adopted in specific contexts at certain points of time. Existing findings reveal that students employed different strategies to study the shape, pronunciation, or meaning of characters at different learning stages (e.g., first-exposure, preview, or review) for different purposes (e.g., memorisation or doing practice). Although some studies explored factors underlying students' character learning strategies based on the data collected from the same inventory, their results are inconsistent (e.g., Shen, 2005; Sung, 2012, 2014). Some studies even generated conflicting results. The contradictory findings on L2 learners' character learning strategies mainly lie in three areas.

The first area of inconsistencies is related to whether repeated practice or using orthographic knowledge (e.g., radicals) is useful. For example, some studies showed that adult CFL learners in the US frequently used rote repetition and repeated handwriting to develop reading and writing skills and believed they were among the most useful strategies (e.g., McGinnis, 1999; Yin, 2003). In particular, low proficiency learners studied each character as a whole rather than relied on orthographic knowledge about radicals and phonetic components (McGinnis, 1999; S.-h. Wang, 1998). In contrast, others (Ke, 1998; Shen, 2005; Sung, 2014; J. Wang & Leland, 2011) found that students relied heavily on orthographic-knowledge-based strategies and considered them useful in learning new characters. The inconsistencies can be attributed to the potential influence of teaching and curriculum. Arguably, if students were not exposed to orthographic knowledge, it would be unlikely for them to use related strategies in learning. To tease out the contradictory findings of the previous studies, it is necessary to report teaching strategies that students experienced as contextual information when investigating learning strategies. Therefore, the current study will report the teaching strategies that students experienced in this study in Section 3.2.

The second area of contradictions lies in teachers and students' attitudes towards handwriting. Although some studies showed that CFL learners believed repeated handwriting was the most effective strategy to learn characters (e.g., Yin, 2003), some CFL educators argued that learning to write Chinese was a waste of time (Allen, 2008). Interestingly, in Ye's (2013) large-scale survey of 936 students and 186 teachers at American universities, both teachers and students were reluctant to delay the learning of characters, although students believed that handwriting characters was the most challenging task in learning Chinese. X. Jiang (2007) found that requiring students to recognise more characters than handwrite them enhanced learning outcomes, rather than asking them to recognise and handwrite an equal number of characters. Existing findings suggest that adjusting the requirements for recognising and producing characters may reduce the difficulties in learning characters and enhance learning outcomes.

The third aspect of discrepancies lies in whether students use technologies to support their character learning. In Yin's (2003) study, American college students rarely used computers to facilitate their learning of characters. With the implementation of technologies in CFL teaching, however, recent studies reveal that students largely utilised technologies to facilitate their character learning (e.g., Kuo & Hooper, 2004; X. Liu & Olmanson, 2016; Qian, Owen, & Bax, 2018; Mason & Zhang, 2017). The latest research shows that radical knowledge, typing, and playing games, with the aid of a variety of online platforms and mobile applications, can accelerate character acquisition and enhance learning outcomes. For example, Manson and Zhang's survey (2017) showed that the majority of the CFL learners in their study used mobile applications to facilitate their learning of characters, particularly for searching example sentences and looking up stroke orders. Pleco was the most frequently used mobile app. Qian, Owen, & Bax (2018) found that UK-based distance learners at the beginner Chinese level adopted some new strategies to learn characters, such as typing pinyin to learn to recognise new characters and constant self-testing. Notwithstanding the proven effectiveness of technology-supported strategies in current character learning, no study has examined CFL learners' strategies for learning characters in emergency online teaching.

2.2 Emergency online teaching

Emergency online teaching that emerged during the Covid-19 pandemic is perceivably different from traditional online education. Remote delivery or online teaching, associated with distance learning or e-learning, has been implemented in education for more than decades. Despite the subtle differences among their implications, these terms share common characteristics, that is, learners access instruction, learning materials, and resources remotely, particularly with the aid of online learning platforms in this digital era. However, traditional online courses are designed with a curriculum for the purpose of online presentation and with a virtual audience in mind. Students are expected to view pre-recorded lecture videos and access accompanying materials electronically at flexible times. Interactions between individual learners and the instructor are generally through asynchronous text-based communications. Online courses offered through MOOC, Coursera, and FutureLearn belong to this category.

However, current emergency online teaching is a reactive online model, which reflects on the reactionary experience to Covid-19 and involves interactive live classes. University academics and teaching professionals scrambled to move courses planned for face-to-face classes online to maintain the existing subject learning outcomes. Therefore, some researchers argue that emergency online learning should be considered a temporary solution to an immediate problem (e.g., Golden, 2020). Most importantly, different teaching approaches and communication channels were adopted under this umbrella term: emergency online teaching. Subject content can be delivered through any combination of these options: 1) live streaming a class; 2) recording and sharing pre-recorded materials, 3) running live online classes, 4) using text-based chats in forum or blog, and 5) a variety of resources provided on learning platforms. For instance, the Chinese language courses involved in this study adopted a combination of all the above approaches. Therefore, in this study, emergency online teaching refers to the environment where teaching and learning activities occur in a general sense rather than specific online models which course content is delivered through.

3 The study

3.1 Research questions

To fill the gaps mentioned above, the current study addresses the following research questions.

1. What are students' perceptions of the difficulties in learning Chinese characters in emergency online teaching?
2. What challenges do students experience while learning Chinese (characters) in emergency online teaching?
3. What are students' effective strategies to develop their character writing or reading skills in emergency online teaching?
4. What is students' overall satisfaction with the teaching strategies and arrangements and their learning progress in emergency online teaching?

3.2 Context - character teaching strategies

In mid-March 2020, the university where this study was carried out pushed forward mid-session break after three weeks' teaching in Semester 1. After two weeks of tech training and preparation, all courses were transitioned to a remote delivery mode in early April. In response to the urgent requirements surrounding emergency online learning, the Chinese courses continuously used the existing teaching materials, resources, and approaches designed for face-to-face instruction, but also made the following

adjustments in teaching modes and assessment requirements: 1) replacing face-to-face classes with live Zoom classes; 2) splitting the summative assessments that require handwriting characters (e.g., dictation and written tests) into timed online quizzes that require reading and typing characters and formative assessments (e.g., handwritten assignments).

The character teaching materials were developed based on the latest research findings of effective character teaching strategies: 1) the character-based model (e.g., T. Xu， 2008); 2) usefulness of radical knowledge (Taft, M., & Chung, K., 1999) and radical based grouping (Y. Xu, Chang & Perfetti, 2014); 3) the benefits of visual aids (Kuo & Hooper, 2004; A. Wang, & Thomas, 1992; J. Wang & Blackwell, 2015; Lu, Hallman, & Black, 2013); and 4) practice (DeKeyser, 2007) in the use of various learning resources. For instance, when introducing new words, characters were presented following a character-based model despite the word-based model (i.e., introducing new words/expressions and grammar in the order of communication needs) that was compiled in the textbooks (Integrated Chinese Level 1 Part 1- Level 2 Part 1). Characters in PPT slides and character sheets were grouped according to radicals, meaning, or pronunciation to develop students' orthographic-radical-knowledge and facilitate their memorisation of characters. The semantic and phonetic components of characters were displayed to reflect the meaning of characters with visual aids (e.g., images and graphs) in PPT slides embedded with text, links to videos, animation, pictures, and practice tasks, particularly for pictographic characters and those that are hard to memorise due to weak semantic/phonetic cues. All PPT slides, along with a wide arrange of character learning resources (e.g., memory games, flashcards, and links of mobile apps), were made available on the subject Moodle sites to develop students' declarative knowledge of characters (e.g., stroke order, radical, etymology, and pronunciation), serve as learning tools (e.g., online translator or dictionaries), and facilitate their self-study and review out of class.

When teaching characters in live Zoom classes, students were encouraged to find out the logic and ideology behind character construction and the meaning of radicals and characters through doing tasks (e.g., spotting differences or similarities among characters in their radical, graph, meaning, and pronunciation or sharing useful mnemonics, tips, and wild stories with peers). This was because radical information, meaningful interpretation, and chunking proved to be effective in enhancing character learning outcomes (e.g., Shen & Ke, 2007; Tong & Yip, 2015; J. Wang & Koda, 2013; X. Xu & Padilla, 2013).

Students' character writing and reading skills were assessed with a series of formative and summative tasks in this emergency online mode. Formative assessments included handwritten assignments (e.g., handwriting character sheets and answers to workbook exercises) and weekly Moodle quizzes. Summative assessments included timed Moodle quizzes in a variety of question types (e.g., multiple-choice, matching, and short/long answers). The assessment adjustments aimed to reduce students' stress and technological obstacles in conducting summative assessments in live Zoom classes. The assessments also ensured that students develop their character reading, handwriting, and typing skills through practice out of class, since practice is the key to developing proficiency and automatism within a given skill (e.g., DeKeyser, 2007).

3.3 Method

3.3.1 Participants

Participants were 40 students enrolled in three levels of CFL courses at an Australian university (26 first-year, 7 second-year, and 7 third-year students). They included 8 males and 32 females, with an average age of 21 (range 17-24). The majority of the participants had no or little prior knowledge of Chinese, particularly the absolute beginners who just started their learning of Mandarin Chinese. Those enrolled in the second- or third- year subjects had attended approximately 120 hours and 180 hours of Chinese lessons, respectively, by the time of participation. The participants' actual proficiency in Chinese ranges from the beginning to intermediate level.

3.3.2 Instruments

This study adopted a mixed-method to collect quantitative and qualitative data. This design was based on the following considerations. First, research questions asked about students' difficulties and strategies for learning characters in remote delivery. Qualitative data can provide details and paint a holistic picture for the status quo (i.e., teaching and learning characters in a remote delivery setting). Second, there is no ready-made inventory available to suit the needs for answering the research questions. The existing character strategy inventories were constructed based on students' learning experience in face-to-face instruction, so they consequently may not be able to accurately capture and reflect students' experiences and perceptions in emergency online delivery. Students' responses to some survey questions were collected and analysed quantitatively to synthesise findings.

This study employed an online questionnaire and follow-up interviews to collect data. The questionnaire was developed based on a pilot study on character learning strategies and the literature on CFL learners' challenges and strategies for learning characters. The semi-structured questionnaire consisted of 5 closed-ended and 7 open-ended questions (See Appendix 1). Open-ended questions were adopted to collect rich data from learners as face-to-face interaction was reduced to a minimum level amid the COVID-19 pandemic. The questions aimed to collect information on the following: 1) the participants' learning background (e.g., age, gender, learning hours, and reasons for learning Chinese); 2) their perceptions of the difficulties of different elements in Chinese and challenges confronting their learning in remote delivery; 3) their effective strategies for developing character writing and reading skills; and 4) their overall satisfaction with the teaching strategies and their learning progress. The participants were required to rate the difficulties of learning different aspects in Chinese on a five-point Likert scale, where 1 = very easy, 2 = fairly easy, 3 = neither easy nor difficult, 4 = a little difficult, 5 = very difficult. All questions were worded to avoid linguistic jargon and suit students' general understanding and foreign language learning experience.

3.3.3 Procedure

The questionnaires were administered online due to travel restrictions amid the Covid-19 pandemic. A link of the online questionnaire was distributed to 100 students who were enrolled in the Chinese courses at the beginning of the semester via a brief email invitation in mid-April 2020. Students were invited to complete the survey out of class and were assured that their participation was voluntary and anonymous. Forty students completed the online survey by the end of May. The relatively low response rate (40%) can be attributed to voluntary participation, withdrawals from the subjects, and the cease of learning. Eight students also voluntarily participated in follow-up interviews via email or Zoom chats to provide more detailed explanations to their responses.

3.3.4 Analysis

The research questions were answered both qualitatively and quantitatively. With regards to RQ1 about the difficulties in learning different elements, mean scores of students' ratings were calculated and then ranked. To answer RQs 2-4, thematic analysis was used to code qualitative responses based on the constant comparison. The count and percentage of responses falling in each thematic category were calculated based on qualitative data.

4 Results and Discussion

For the reader's convenience, this section combines results and discussion to provide immediate interpretation for the results and compare findings with those of relevant studies.

4.1 Comparative difficulties for learning Chinese characters (RQ1)

RQ1 asked about students' perceptions of the difficulties of characters compared to other linguistic components in Chinese. The mean, standard deviation, and rank of the difficulties of various Chinese items by students' ratings are shown in Table 1.

Table 1

Mean, Standard Deviation, and Rank of the Learning Difficulties of Chinese Elements

Item	Mean	Std. Deviation	Rank
listening comprehension	3.82	1.185	1
pronunciation (tones)	3.45	1.301	2
composition	3.36	1.22	3
grammar (function words)	3.27	1.232	4
grammar (sentence order)	3.12	1.386	5
pronunciation (some initials or finals)	2.97	1.287	6
character writing	2.88	1.409	7
vocabulary	2.82	1.185	8
character reading	2.79	1.219	9
reading comprehension	2.70	1.015	10
translation	2.70	1.237	11
pinyin	2.61	1.321	12

As Table 1 shows, writing and reading characters ranked 7 or 9 out of 12 elements/skills, respectively, meaning they were not as difficult as reported in the literature (Ye, 2013; Yin, 2003) or anecdotal evidence (Allen, 2008). Instead, listening comprehension, pronunciation (tones), composition, grammar, and pronunciation (some initials or finals) were believed to be harder than character writing and reading.

This result can be explained from three perspectives. First, absolute beginners accounted for the largest portion (63%) of the sample. By the time of participation, they were just exposed to pinyin and mainly assessed on their mastery of pinyin and pronunciation rather than character writing skills. This accounts for why they perceived tones and pronunciation to be harder than character writing or reading. Second, the coping strategies for teaching characters in remote delivery might have eased the difficulties of learning characters. Substantial information on character knowledge was made available for students to study at their own pace. The rule and orthographic knowledge could have enriched their declarative knowledge of characters. In addition, teaching materials (e.g., PPT slides with visual aids) and learning resources/materials (character sheets) might have facilitated students' memorisation of characters. Third, adjusted assessments might have reduced the difficulties of assessment tasks related to character writing and mitigated students' stress or anxiety for learning characters. For example, the production of words and sentences from dictation was replaced by formative assessments involving handwritten assignments. Summative assessment in the form of Moodle quizzes mainly assessed students' typing and reading skills. As many students reported, typing is much easier than handwriting, especially dictation, which

requires students to handwrite characters from memory. The assessment of typing and reading skills over other methods of assessment, such as dictation, meant that students could focus on memorising the meaning of words and have spare time for learning other challenging aspects of Chinese.

4.2 Challenges for learning characters in remote delivery (RQ2)

RQ2 asked about the challenges that students were confronted when learning Chinese (including characters) in remote delivery. The participants' responses to this question are also borne out the result of RQ1. Students' qualitative responses fall into seven common themes (see Table 2).

Table 2

Challenges for Learning Characters in Remote Delivery by Number and Percentage of Responses

Items	Count (N=40)	Percent
1. practice speaking with peers and others	11	28%
2. mental health wellbeing (motivation, self-discipline, self-study)	8	20%
3. tech issues (internet speech, sound, crash)	6	15%
4. time/space environmental constraints	5	13%
5. immediate interaction/feedback/ guidance/ encouragement from teachers	5	13%
6. demands of subjects (e.g., amount of content, participation, learning pace)	4	10%
7. not sure	1	3%

The challenges listed in Table 2 can be further grouped into five large categories: 1) oral interactions (a combination of items 1 and 5) (41%), mental health and wellbeing (28%), tech and physical constraints (i.e., a combination of items 3 and 4) (26%), subject demands and workloads (10%), and not sure (3%). As students reported, speaking practice was affected most in online learning. Although synchronous virtual classes served as a remedy for delivering live classes to meet social distancing requirements, they are different from face-to-face interactions and have some unavoidable limitations. For example, although Zoom contains a breakout-room function for peer or group work, it takes time for the teacher to enter or leave each group to check group performance and provide tailored feedback. It is even more time-consuming and challenging for the teacher to do so in a large class, including 20+ participants. Furthermore, students were required to keep their camera and microphone off to protect their privacy and ease the bandwidth, which might have increased difficulties for facilitating verbal conversations and interactive responses. Therefore, listening and speaking tasks and oral-aural interactions were affected most by the online teaching situation. In contrast, character writing and reading were mainly performed by students out of class, so that they were considered less challenging than oral communicative tasks (listening, speaking, and pronunciation).

The second major challenge is learners' mental health and wellbeing. Given the fact that students had to self-study on their own most of the time out of class, remote learning has increased demands for students' self-discipline and time management skills. Plus, some students felt stressed out for a range of reasons, such as coping with family issues, work loss, and mental wellbeing. According to some students, lack of time management skills, deteriorating concentration in the online environment, and shortage of time due to juggling between multiple commitments were the major obstacles for them to study characters on their own. In addition, a few students reported that lack of face-to-face interactions and encouragement from teachers and peers reduced their motivation to continue studying this difficult language. The result of the impact of self-discipline skills on character learning is in line with N. Jiang's (2018) findings on the importance of self-regulation in the development of character learning strategies by Irish university students.

A new challenge associated with online learning is technical issues (e.g., internet connection and speed, unclear sound) and physical constraints (e.g., time difference and study space). Internet bandwidth somewhat determined the successfulness of Zoom virtual classes. Technological issues, such as line drop, computer crashes, and interruption by random intruders sometimes ruined well-prepared synchronous virtual classes. In addition, writing on a whiteboard could not be used frequently due to the time constraint for asking students to share screens and the difficulty in drawing characters using a mouse. With regards to the time and space constraints, some students reported that studying at home was disrupted by other family members who were doing other activities. Internet bandwidth was influenced by others who were using the internet simultaneously for synchronous online meetings. The students who returned to their home countries in America or Europe had to attend Zoom virtual classes early in the morning or late at night from different time zones. The time difference is an additional factor that increased their fatigue in emergency online learning.

An additional challenge came from the workload demands of the Chinese courses. Mandarin is one of the few languages ranked as the most difficult to learn for English speakers by the Foreign Service Institute in the US. It generally takes three times more hours for English native speakers to achieve proficiency in Chinese than in a European language (e.g., Spanish). Some students, especially those who were enrolled in more subjects than required reported that they were short of time to complete formative assessments because they had to meet the academic requirements for five or six subjects as well as work commitments. Yet, the majority of the respondents requested to have a Chinese native speaking language partner to help them practise oral conversations outside of class.

4.3 Useful strategies for developing character writing and reading skills (RQ3)

RQ 3 investigated the strategies that participants adopted to develop their character writing and reading skills and their perceptions of the usefulness of those strategies. Table 3 lists the effective strategies that the students used to develop their character writing and reading skills, respectively.

Table 3

Useful Strategies for Developing Character Writing or Reading Skills by Number and Percentage of Each Category

Character writing			**Character reading**		
Strategies	**Count (N = 40)**	**Percent**	**Strategies**	**Count (N=40)**	**Percent**
Repetitive writing	27	68%	Repetitive practice (reading and reading aloud or writing)	25	63%
			Write a lot (writing to read)	8	20%
Using a variety of resources to memorise (e.g., character sheets)	8	20%	Reading/memorisation using a variety of resources (e.g., textbook, workbook, teaching slides, subtitles of TV programs)	3	8%
Flashcards, analysing structure of characters	4	10%	Study radicals, grammar, and do quizzes	3	8%
No strategy	1	3%	Not sure	1	3%

As Table 3 shows, the respondents adopted similar strategies to develop character writing and reading skills. They overwhelmingly adopted repeated practice to develop their writing and reading skills and reported that the laborious strategy was useful for memorising characters. This result was consistent with Yin's (2003) findings in that students believed that repeated practice was conducive to memorising the shape, pronunciation, and meaning of characters in face-to-face instruction. Interestingly, 20% of the respondents even considered handwriting as an effective strategy to develop character reading skills. This result lends support to Zhang & Reilly's (2016) findings that practising handwriting benefits the development of character reading skills. The findings bore out the skill acquisition theory (DeKeyser, 2007) in that practice is the key to developing procedural or implicit knowledge and achieve proficiency and automatic performance. Nearly all respondents reported that writing was more laborious and time-consuming than reading, except one student believed reading was as difficult as writing.

About 20% of the respondents argued that they utilised a variety of resources provided to facilitate their memorisation of characters. The teaching resources and explicit explanations might have helped students to develop their declarative knowledge of characters and turn rote memorisation into comprehensible learning. According to Krashen (1982), comprehensible input facilitates L2 acquisition. Most importantly, explicit character knowledge can lay a solid foundation for students to discover rules for learning a wealth of other characters and benefit the expansion of characters and vocabulary in their future study. This more easily attainable character acquisition facilitated by a variety of resources might have also eased students' fear of learning Chinese characters, which are new to them and completely different from English writing scripts.

The students perceived that repeated practice was essential and effective to develop their character writing and speaking skills, even in the online delivery mode. This result can be attributed to the inherent property of characters and the nature of character acquisition. The finding is in line with those of previous studies in that orthographic knowledge (e.g., radicals) is less favoured and adopted in learning characters by beginners (X. Jiang & Zhao 2001; Shen 2005). In addition, practice at writing characters using character sheets was proven to be helpful by eliciting students to infer "rules" governing characters rather than rote memorising individual characters as an unrelated whole. This deep cognitive processing might have developed students' procedural knowledge of character production.

4.4 Students' satisfaction with the character teaching strategies (RQ4)

RQ4 examined students' overall satisfaction with the teaching strategies and assessment arrangements and their own learning progress. Results show that more than half of the respondents (64%) were satisfied with the teaching strategies and assessment arrangements as well as their progress during remote delivery. However, some reported that their performance or the effectiveness of the teaching strategies was influenced by the following constraints: shortage of time (25%), technological issues (10%), and mental health and wellbeing (10%). About 21% of the respondents indicated their disfavour of remote delivery. The remaining respondents (15%), mainly beginners, responded "not sure" because it was hard for them to compare two teaching modes due to their limited experience in face-to-face Chinese classes. The negative impact of remote delivery on character learning can be attributed to deteriorated interactions in Zoom classes due to technological issues, which, in turn, affected students' motivation to continue their studies of Chinese, including characters.

The results can also be explained by the linguistic characteristics of character writing and reading activities. Character writing and reading are solitary tasks that require a lot of repetition to achieve a certain level of proficiency. Some students juggled between work, study (multiple subjects), and family commitment, so that they did not have enough time to practise writing characters. Particularly, most of their other subjects adopted an asynchronous remote delivery mode, which significantly increased their reading time and workloads. In addition, remote delivery reduced face-to-face interactions and

added extra demands for students' self-discipline and time management skills. Their difficult learning experience amid unfortunate circumstances and lack of encouragement from teachers and support from peers might have placed extra pressure on them, which, in turn, affected their mental wellbeing and motivation for continuing their Chinese study.

5 Conclusion

This study examined Australian students' perceptions of the challenges and strategies for learning characters in emergency online teaching amid the Covid-19 pandemic. The findings contribute to knowledge about Chinese character pedagogy in an online teaching mode. Results show that students' perceived difficulties in writing and reading characters were not as severe as reported in the literature and anecdotal evidence. The teaching strategies and adjusted assessment requirements eased the difficulties in learning characters in emergency online teaching. In addition, technology-supported teaching and learning strategies provided new ways to overcome the challenges for performing formidable tasks. For example, typing characters can free students from laborious handwriting tasks and enable them to focus on meaning and communication and deal with other challenging aspects in Chinese (e.g., pronunciation and grammar). In addition, a combination of formative and summative assessments might have reduced students' stress in learning characters and heavy burdens in handwriting characters.

New challenges for learning Chinese characters in online teaching mainly resulted from technological, physical and time constraints, and their influences on students' mental health and wellbeing. The time demands for handwriting was a considerable challenge for students to learn characters since all students were short of time. Findings call for the improvement of quality of education technology, including internet connections and bandwidth. Breakthroughs in educational technologies will enhance the effectiveness of virtual classes and online learning.

This study is part of a longitudinal project that investigates character teaching and learning strategies. The qualitative results of this study can be used to develop an inventory for character teaching and learning strategies in the online delivery mode. Due to the time limitation, the sample size of this study is relatively small. Large-scale studies are needed to generalise the findings of this study in the future.

The character teaching strategies implemented in the study can provide insights into innovative approaches to teaching and learning characters in CFL/CSL. The integration of the character-based model into curriculum design may ease the difficulties in teaching and learning characters. The strategies may inspire CFL teachers to integrate the latest research findings into their teaching practice to deal with new challenges in teaching and improve learning outcomes. The findings call for teachers and educators to pay additional attention to affective factors (e.g., motivation, self-discipline, and anxiety) that could affect the effectiveness of teaching strategies. Finally, this study may also serve as a valuable reference point for future studies of how teachers' and students' perceptions change over a longer period in online delivery.

Appendix: Questionnaire

Dear student:

This survey aims to help find out your perceptions of the challenges, your strategies for learning Chinese, particularly Chinese characters in remote delivery. The results will be used to for instructors to design and enhance teaching strategies to facilitate your learning. Please respond to the questions based on your true feelings and experience. Thank you for your cooperation.

1. How old are you?
2. Do you identify yourself as a male or female or rather not say?

3. What is your native language?
4. How long ago did you start learning Chinese? How many hours of Chinese lessons have you taken?
5. Why are you learning Mandarin? Or what are your motivations for learning Mandarin?
6. What challenges are you confronted in learning Mandarin in rote delivery?
7. Could you please rate your difficulties in learning the following in remote delivery on a 5-point Likert scale? 1= very easy, 2= fairly easy, 3 = neither easy nor difficult, 4 = a little difficult, 5 = very difficult.

Item	1	2	3	4	5
- character reading					
- character writing					
- composition					
- grammar (function words)					
- listening comprehension					
- grammar (sentence order)					
- pronunciation (tones)					
- pronunciation (some initials or finals)					
- pinyin					
- reading comprehension					
- translation					
- vocabulary					

8. What are your strategies for developing character writing skills? Are they effective? What help do you need?
9. What are your strategies for developing character reading skills? Are they effective? What help do you need?
10. Are you happy with your progress in learning characters?
11. Are you happy with the current arrangements for teaching and assessing character skills?
12. Are you happy with your progress in learning Chinese? What challenges are you confronted in meeting your course requirements?

References

Allen, J. R. (2008). Why learning to write Chinese is a waste of time: A modest proposal. *Foreign Language Annals, 41*(2), 237-251.

DeKeyser, R. M. (2007). Skill acquisition theory. In B. VanPatten & J. Williams (Eds.), *Theories in second language acquisition: An introduction (pp. 97-113)*. New Jersey:

Everson, M. E. (1998). Word recognition among learners of Chinese as a foreign language: Investigating the relationship between naming and knowing. *The Modern Language Journal, 82*(2), 194-204.

Everson, M. E. (2011). Best practices in teaching logographic and non-Roman writing systems to L2 learners. *Annual Review of Applied Linguistics, 31*, 249-274.

Golden, C. (2020, 23 Mar). Remote teaching: The glass half-full. *EDUCAUSE Review*. https://er.educause.edu/blogs/2020/3/remote-teaching-the-glass-half-full. [Accessed on 25 July 2020].

Jiang, N. (2019) Self-regulation and Chinese character learning strategies in Irish Higher Education. *(Unpublished doctoral thesis). The University of Dublin*, Ireland.

Jiang, X. & Zhao, G. 江新 & 赵果 . (2001). 初级阶段外国留学生汉字学习策略的调查研究 (A survey on the strategies for learning Chinese characters among CSL beginners). 语言教学与研究 (*Language Teaching and Linguistic Studies*), (4), 10-17.

Jiang, X. 江新 . (2007). " 认写分流 , 多认少写 " 汉字教学方法的实验研究 (An experimental study on the effect of the method of 'Teaching the learner to recognise characters more than writing'). 世界汉语教学 (*Chinese Teaching in the World*), *80* (2), 91-97.

Johnston, M. (2020, 20 May) Online mass exodus: How Australian unis are coping with COVID-19, *Itnews*. https://www.itnews.com.au/news/online-mass-exodus-how-australian-unis-are-coping-with-the-covid-19-pandemic-539630. [Accessed on 25 July 2020].

Ke, C. (1998). Effects of strategies on the learning of Chinese characters among foreign language students. *Journal of Chinese Language Teachers Association, 33*, 93-111.

Kuo, M.-L. A., & Hooper, S. (2004). The effects of visual and verbal coding mnemonics on learning Chinese characters in computer-based instruction. *Educational Technology Research and Development, 52*(3), 23-34.

Krashen, S. D. (1982). *Principles and practice in second language acquisition* (1st ed.). Oxford; New York: Pergamon.

Ling, V. (2007) Studies on L2 acquisition of the Chinese script published in America. *The Cognition, Learning and Teaching of Chinese Characters*, 51-83.

Liu, X., & Olmanson, J. (2016). A technology-supported learning experience to facilitate Chinese character acquisition. *The Nebraska Educator: A Student-Led Journal, 30*, 87-107.

Liu, Yu., Yao, T.-c., Bi, N.-P., Shi, Y., Ge, L. (2016) (Eds.) *Integrated Chinese* (4th Ed.), Vol. 1, Boston, MA: Cheng & Tsui company.

Lu, M. T. P., Hallman Jr, G. L., & Black, J. B. (2013). Chinese character learning: Using embodied animations in initial stages. *Journal of Technology and Chinese language teaching, 4*(2), 1-24.

McGinnis, S. (1999). Students' goals and approaches. In Chu, M. (Ed.) *Mapping the Course of the Chinese Language Field: Chinese Language Teachers Association Monograph Series (pp. 151-168)*, Vol. III. Kalamazoo., Michigan: Chinese Language Teachers Association, Inc.

Mason, A., & Zhang, W. (2017). An exploration of the use of mobile applications to support the learning of Chinese characters employed by students of Chinese as a foreign language. In Q. Kan & S. Bax (Eds.), *Beyond the language classroom: Researching MOOCs and other innovations (pp. 99–112)*. Dublin, Ireland: Research-publishing.net.

Qian, K., Owen, N., & Bax, S. (2018). Researching mobile-assisted Chinese-character learning strategies among adult distance learners. *Innovation in Language Learning and Teaching, 12*(1), 56-71.

Shen, H. H. (2005). An investigation of Chinese-character learning strategies among non-native speakers of Chinese. *System, 33*(1), 49-68.

Shen, H. H., & Ke, C. (2007). Radical awareness and word acquisition among non-native learners of Chinese. *The Modern Language Journal, 91*(1), 97-111.

Sung, K.-Y. (2012) A study on Chinese-character learning strategies and character learning performance among American learners of Chinese. *Chinese as a Second Language Research, 1*(2), 193–210.

Sung, K.-Y. (2014). Novice learners' Chinese-character learning strategies and performance. *Electronic Journal of Foreign Language Teaching, 11*(1), 38-51.

Taft, M., & Chung, K. (1999). Using radicals in teaching Chinese characters to second language learners. *Psychologia, 42*(4), 243-251.

Thomala, L.-L. (2020). *Number of internet users in China 2008-2020*. Published on 30 Apr, 2020. https://www.statista.com/statistics/265140/number-of-internet-users-in-china/ [Accessed on 22 Jun 2020].

Tong, X., & Yip, J. H. Y. (2015). Cracking the Chinese character: Radical sensitivity in learners of Chinese as a foreign language and its relationship to Chinese word reading. *Reading and Writing, 28*(2), 159-181.

Wang, A. Y., & Thomas, M. H. (1992). The effect of imagery-based mnemonics on the long-term retention of Chinese characters. *Language Learning, 42*(3), 359-376.

Wang, J., & Koda, K. (2013). Does partial radical information help in the learning of Chinese characters. Voss, E., S.-J. D. Tai, & Z. Li (Eds.) *Selected proceedings of the 2011 second language research forum: Converging theory and practice (pp. 162-172)*.

Wang, J., & Leland, C. H. (2011). Beginning students' perceptions of effective activities for Chinese character recognition. *Reading in a Foreign Language, 23*(2), 208-224.

Wang, L., & Blackwell, A. A. (2015). Effects of dual coded multimedia instruction employing image morphing on learning a logographic language. *Journal of Educational Multimedia and Hypermedia, 24*(3), 281-313.

Wang, S.-h. C. (1998). A study on the learning and teaching of Hanzi-Chinese characters. *Working Papers in Educational Linguistics, 14*(1), 69-101.

Xie, Y. (2020). Instructional interventions and character learning strategies: A study on orthographic study assignments. In Sung, K. Y. (Ed.) *Teaching and Learning Chinese as a Second or Foreign Language: Emerging Trends (pp. 127-142)*, London, UK: The Rowman & Littlefield Publishing Group.

Xu, X., & Padilla, A. M. (2013). Using meaningful interpretation and chunking to enhance memory: The case of Chinese character learning. *Foreign Language Annals, 46*(3), 402-422.

Xu, T. 徐通锵 . (2008). 汉语字本位导论 *Introduction to the Chinese character-based model*. Jinan, Shandong: Shandong Education Publishing House. 济南 , 山东：山东教育出版社。

Xu, Y., Chang, L. Y., & Perfetti, C. A. (2014). The effect of radical-based grouping in character learning in Chinese as a foreign language. *The Modern Language Journal, 98*(3), 773-793.

Ye, L. (2013). Shall we delay teaching characters in teaching Chinese as a foreign language? *Foreign Language Annals, 46*(4), 610-627.

Yin, J., 印京华 . (2003). 美国大学生记忆汉字时使用的方法 - 问卷调查报告 (A survey report on American college students' strategies for memorising Chinese characters). J*ournal of the Chinese Teachers Association, 38*(3), 69-90.

Zhang, Q., & Reilly, R. G. (2015). Writing to read: the case of Chinese. *Proceedings of the 29th Pacific Asia Conference on Language, Information and Computation (pp. 345 – 354)* https://www.researchgate.net/publication/283509754_Writing_to_Read_the_Case_of_Chinese [Accessed on 22 Jun 2020].

Dr Xiaoping Gao is Senior Lecturer in Chinese, Languages and Linguistics Discipline Leader at the University of Wollongong, Australia. Her research expertise includes second language acquisition, teaching methodology, and intercultural communication. She has published extensively in international journals and books, and has received three national and university teaching awards since 2013.