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ABSTRACT

This study aims to determine the perception of learners in learning Chinese characters during Mandarin's ODL session, identify the learners' ability in recognizing and reading Chinese characters, and associate the above with the deemed effectiveness of various learning strategies applied by learners in learning Chinese characters, especially during Mandarin's ODL sessions. This study discovers that all respondents think that learning Chinese characters is both very important and interesting, which is a positive indication that students have the necessary motivation and initiative to learn characters through methods they deemed effective, which are primarily based on the principle of "prioritizing Chinese characters with Pinyin as auxiliary". Further findings also indicate a strong connection between remembering a character and remembering its pronunciation, in which students show a higher level of self-confidence in their ability to correctly pronounce the characters that they have learned and are able to comprehend the meaning of words and sentences, and therefore improved their ability to type

or write out the characters correctly after listening to its pronunciation. In addition, this study deduced that students prefer using more comprehensive Chinese character learning strategies that involve all three elements, which are the phonetic, orthographic and meaning system of a character at once. However, the regression of deemed effectiveness of practice and review strategies particularly on the graphic comprehension and graphic production features, has also reflected a comparatively lower confidence in students to differentiate characters with a similar shape. Therefore, teachers or instructors should provide proper guidance, encouragement and even demonstrations to students that involve various effective learning strategies, to help motivate students to use those strategies frequently and for a long-term period, which aims to enhance and improve their characters learning process and experience.

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1. INTRODUCTION

The Mandarin courses offered by local Malaysian universities are often beginner level, which are intended for students with little or no prior exposure to the language, and basically has a tendency towards teaching commonly used phrases or expressions in daily communication. The Mandarin courses in some universities prioritize Hanyu Pinyin, while assisted by Chinese characters in their teaching (Tan & Hoe, 2017). However, the beginner level Mandarin courses offered by Universiti Putra Malaysia (UPM) are comprehensive courses that have included language elements, language skills and communicative language teaching. The objective of such comprehensive courses is to nurture students' ability to effectively and comprehensively apply the target language in daily communication. Therefore, the teaching and learning of Chinese characters is considered crucial and essential. Hence, after learning Hanyu Pinyin in the beginner level courses, it is then necessary for students to use Chinese characters in all Mandarin class sessions, as well as various exercises and tests. This shows the Mandarin courses in UPM value the importance of Chinese characters in both their teaching and learning process.

Chinese characters are writing scripts that are considered extremely difficult language elements for Chinese as a Foreign Language (CFL) learners, especially for those whose native language does not have Chinese characters or something similar (Zhan & Cheng, 2014). Besides, non-native Chinese learners usually face difficulties in learning the Chinese language because they do not have a supportive learning background for them to use the language (Goh, 2016). Therefore, the teaching and learning process of Chinese characters poses several challenges in Mandarin learning, as there are hundreds or thousands of Chinese characters needed to be learned, and students will not be able to achieve anything without investing a huge amount of time and effort in learning Chinese characters. In addition, the difficulty of teaching Chinese characters one at a time within limited hours of class sessions also proved to be challenging for beginner level learners as well. On the other hand, if learners choose to learn only Pinyin or focus mainly on verbal communication, their Mandarin language skills will remain stagnant upon reaching a certain level. This is due to a significant amount of homonyms and homophones that exist in Mandarin, in which

the learners will be unable to understand or express the correct meaning of a certain word, if the homonym or homophone are not differentiated through Chinese characters.

To fully master all of the listening, speaking, reading and writing skills is usually the aim of foreign language learners. However, if Mandarin learners do not learn Chinese characters, they will lack both the reading and writing skills, which is still considered as illiterate in terms of written communication. Yet, Mandarin learners are often deterred by the large number of Chinese characters, the complexity of the characters' structures, as well as the diversity of stroke orders and numbers. Hence, Mandarin learners generally believe that Chinese characters are hard to differentiate, hard to remember, hard to learn and hard to write.

Compared to the languages that the majority of local students are more familiar with, such as English and Malay which are based on the Roman alphabet, Mandarin and Chinese characters are considered to be among the most difficult languages to learn. Mandarin learners that are already accustomed to alphabetical first languages tend to find Chinese writing difficult to learn. This is because in alphabetical writing systems, the orthography of a phrase typically has a specific relationship with its pronunciation, which is known as the grapheme-phoneme correspondence (GPC) rule. Chinese orthography, on the other hand, is logographic and composed of radicals in two-dimensional squares. As specific characters do not necessarily correspond to specific phonemes, one cannot know a character's pronunciation simply by observing its representation. International students or heritage Chinese learners whose learning strategies may rely on phonemes probably are accustomed to determining a word's pronunciation by simply reading the representation (Xu, Chang & Perfetti, 2014). Moreover, the writing system for Chinese characters is different from the alphabetical writing system of the learners' first language, either English or Malay, which may contribute to slow progress in their learning (Ling, Chin, & Unin, 2019).

Due to the current COVID-19 pandemic and various accompanying lockdown restrictions since the year 2020, all teaching and learning sessions, including Mandarin courses, had to shift towards the online distance learning (ODL) mode. Consequently, such changes have imposed greater difficulties and challenges in the teaching and learning of Mandarin, especially Chinese characters, as teachers are no longer able to conduct face-to-face teaching as usual, apart from the lack of relevant and effective countermeasures available to both teachers and learners to overcome those challenges. Thus, in order to gain a better understanding of the difficulties and challenges faced by learners in learning Chinese characters, it is important to study the learners' opinions and perspectives regarding learning Chinese characters, as well as their proficiency in the recognition and reading skills of Chinese characters, while studying Mandarin through ODL mode. Furthermore, performing analysis on the Chinese characters learning strategies frequently used by Mandarin learners will also allow teachers to aid students' improvement through instructional design and syllabus arrangement. With proper guidance from teachers, students shall be able to employ more suitable and effective learning strategies to learn Chinese characters with ease, while boosting their passion and ability to master Chinese characters.

2. PURPOSE OF STUDY

The first aim of this study is to identify the perception of learners in learning Chinese characters during Mandarin's ODL session. The second aim is to generalize the learners' ability in recognizing and reading Chinese characters. The third and final aim is to identify the

effectiveness of various types of learning strategies applied by the learners in learning Chinese characters, especially during Mandarin's ODL sessions.

Three research questions corresponding to the purposes of the study stated above, will be addressed through further analysis on the data collected:

1. What are the students' perceptions of learning Chinese characters during Mandarin's ODL sessions?
2. What kind of Chinese characters recognition and reading skills that the learners have gained through autonomous learning under Mandarin's ODL sessions?
3. What are the Chinese character learning strategies commonly used by students under Mandarin's ODL sessions? And which strategies are effective in their opinion?

3. LITERATURE REVIEW

Among the foreign language courses, non-Chinese learners generally have the impression that Chinese characters are the component of Mandarin language that is more difficult to learn, recognize and remember, especially through ODL sessions. The mother tongue of the majority of students in Malaysia generally is either Malay language or English language which is composed of 26 letters in the alphabet system. However, as a logical language, Mandarin is completely different from the Malay or English language system, due to the complexity and diversity in the constructions of Chinese characters, where students are required to be able to perform character writing using 24 basic strokes that can be combined into different forms of radicals and parts that construct a complete character. Besides, students also need to study the stroker orders, as well as the recognizing, differentiating and writing skills. Due to the nature of a Chinese character that functions as a morpheme, where a single morpheme (character) can be used alone to express a certain meaning, or combined with other morphemes (characters) to convey new meanings, learning the Mandarin language, especially Chinese characters, is, therefore, a time-consuming and enervating challenge (Goh, 2016; Ling et al., 2019). Heng & Ling (2014) also mentioned that Chinese character writing is a big challenge to Malay third language (L3) learners. Chinese characters are unique, and therefore, Malay L3 learners need to toil through the tedious process of writing before getting to know them. In conclusion, compared to the mother tongue of the majority non-Chinese students, the Chinese character is definitely among the hardest linguistic symbols to learn.

Due to the social distancing and lockdown caused by the COVID-19 pandemic, many Mandarin classes have switched from the traditional face-to-face in-class teaching to the online distance learning mode. Such transition thus amplifies the challenges in the teaching and learning of Chinese characters writing. Luo (2021) mentioned that the difficulty in teaching Chinese characters is self-evident. In a face-to-face classroom environment, instructors can strengthen students' memory by writing Chinese characters on the blackboard and assigning handwriting homework. However, when teaching online, instructors are more helpless with students' writing problems. Students' homework is completed and submitted online, and students have to type Chinese characters using a keyboard. The problem is that writing Chinese and typing Chinese characters are two different skills with different learning outcomes. Gao (2020) mentioned that the students' perceived difficulties in 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. Zhang (2020) also noticed that teaching Chinese characters online is generally deemed difficult by the teachers. The main difficulty of teaching Chinese characters online lies in the lack of technology affordances for handwriting and prompt interactions. It is extremely challenging, if not impossible, to use a mouse to 'write' characters, even though the software platforms usually contain a 'whiteboard'. However, these practices are very time-consuming and do not allow teachers to keep track of students' learning.

Realizing the challenges Mandarin learners have to overcome in studying Chinese characters, there are multiple researches and investigations that focus mainly on the exploration and analysis of various learning strategies and their effectiveness. Based on a descriptive analysis of a survey of character learning strategies, Shen (2005) identified thirty strategies as commonly used by the learners. A factor analysis revealed that among these commonly used strategies, the orthographic knowledge-based cognitive strategies are the most commonly used, while metacognitive strategies related to structured preview and review are the second most commonly used. Sung's (2014) study illustrated that studying a character's tone, pinyin, and pronunciation helped the participants to comprehend the words their instructors said to them, but did not help them read aloud characters shown to them. On the other hand, using particular orthographic strategies identified in the factor analysis of this study not only helped the participants do well on their graphic comprehension and production parts of the test, but also the phonological production part. The results imply that instructors should inform learners that the use of orthographic strategies may enhance their oral ability and encourage them to try wider variety of strategies.

Moreover, Tan & Hoe's (2017) study showed that students used Chinese characters learning strategies at a moderate rate. The most commonly used strategies were memory strategies, followed by stroke learning strategies. Revision strategies were least used. The results also indicated that only character-form learning strategies and inductive learning strategies have significant correlation with students' Chinese characters acquisition. However, Gao (2020) study showed that 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. This is consistent with the studies by Yang, J. (2018) with learners of England believe that the more practice they do, the easier character learning will be, and the learners still showed their enthusiasm and confidence in learning characters, particularly in writing.

In their study, Yang, T., & Gao, M. (2020) investigated the strategies used by students to learn Chinese characters in a web-based course and the results showed that the three strategies - orthographic and radical knowledge, visualization of characters and rote learning - are found to be helpful and important to students in the web-based course. Liu noted in their study (Liu et al., 2017) that phonological awareness was a significant predictor of word reading only in beginning readers. Morphological awareness and orthographic knowledge were strong predictors of word reading across reading proficiency levels.

It is crucial for Mandarin language teachers and instructors to realize and recognize the importance of students using learning strategies to effectively enhance and improve their characters learning process and experience, amid the challenging time of ODL sessions. Upholding such consensus will allow teachers or instructors to provide students with effective learning strategies, as well as proper guidance, encouragement and even demonstration for students to use those strategies frequently and for a long-term period, which aim to reduce the difficulty in learning process and students' frustration level when learning Chinese characters.

4. METHODOLOGY

The data of this research were collected via questionnaire. A questionnaire was distributed to UPM students after they have completed 14 study weeks of a semester. The findings shall be presented descriptively with the illustrations of tables and figures.

4.1 Respondents and the background of the study

The target participants of this study are beginner-level Mandarin learners, who are of non-Chinese heritage that enrolled in the Basic Chinese Language I course at Universiti Putra Malaysia in Serdang, Selangor, Malaysia. All target participants do not have Chinese character knowledge prior to their enrolment. The questionnaire was distributed to 128 students who had completed the Basic Chinese Language I course under a full semester of ODL sessions. The course has three class sessions per week, where each class session is 60 minutes. Since there are 14 weeks per semester, the course sessions are 42 hours in total. In the end, 117 questionnaires or 91.4% of the students' responses were successfully returned and validated. There were 21 male participants and 96 female participants involved in this study, ranging in age from 19 to 27 years old with an average age of 22. 113 participants are Malaysian, two are Indonesian, one Palestinian and one Bangladeshi. All the participants were taught by the same instructor and the same textbook used in this course is *Experiencing Chinese: Ji Chu Jiao Cheng: Vol. 1* (Jiang, 2006). Out of the 24 lessons in the textbook, students from Basic Chinese Language 1 are only required to study Lesson One to Lesson Seven, in which there are 133 Chinese characters and 109 vocabulary words included.

4.2 The Questionnaire

This questionnaire consists of four sections: (A) Student Information; (B) Students' perceptions of learning Chinese characters; (C) Students' self-assessment of their ability to recognise and read Chinese characters; and (D) Students' commonly used Chinese characters learning strategies.

Section (A) consists of students' demographic information such as age, nationality, and gender. Section (B) consists of three items which include the students' perception of learning Chinese characters. Section (C) consists of five items to generalize the learners' ability to recognize and read Chinese characters. These five items will help sort out the learners' difficulties in learning Chinese characters, such as the ability to distinguish between similarly shaped characters; the ability to type or write the correct character after listening to it; the ability to correctly pronounce the learned character; and the ability to remember the meaning of the learned character.

Section (D) listed the 12 most commonly used Chinese characters learning strategies. These 12 most commonly used Chinese characters learning strategies were adopted from Shen's (2011) 30 most commonly used Chinese character learning strategies. The 12 listed learning strategies in this questionnaire are based on the teachers' experience and methodology in teaching Chinese characters. For example, at the beginning stage of learning Chinese characters, learners are required to pay attention to the stroke order, at the same time connecting new characters learned with similarly shaped characters learned previously. Furthermore, when learning new vocabularies, teachers will also remind learners to retrace the Chinese characters learned from compound words. In addition, teachers will also encourage learners to read out the Pinyin pronunciation of the Chinese characters when they are practicing its writing. Besides, another part of these 12 items is to study the cognition strategies used by the learners themselves, such as whether learners will repeatedly read out the pronunciation of the word after it is presented to the learners for the first time, or whether learners are able to build visual imagery when pronouncing the word. This specific part will be able to help determine the effectiveness of using these Chinese characters learning strategies by the learners.

4.3 Procedures

The questionnaires were administered online due to ODL session restrictions amid the COVID-19 pandemic. A Google Form link to the online questionnaire was distributed via WhatsApp at the end of the semester in mid-January 2021 to 128 students enrolled in the Basic Chinese Language I course. The researcher explained to the students the purpose of the study and the benefits derived from the results of this study. The students were informed that their participation is voluntary and would remain anonymous. After selection, a total of 117 questionnaires were completed and used for the data analysis of this study.

5. FINDINGS AND ANALYSIS

The findings and analysis of data collected through the questionnaire will help to solve the three research questions aforementioned, including (a) students' perceptions of learning Chinese characters during Mandarin's ODL sessions, (b) Chinese characters recognition and reading skills that the learners have gained through autonomous learning under Mandarin's ODL sessions, and (c) Chinese characters learning strategies commonly used that are deemed effective by students under Mandarin's ODL sessions. The outcome analysis is envisioned to better enhance the Chinese character pedagogy, as various effective teaching strategies through online mode can be introduced, recommended and even popularized among local institutes of higher education, where it is hoped to also provide insights and suggestions on improving the development of teaching materials and assessment design for better adaptation to the upcoming trends and challenges of Mandarin's online teaching.

A) Students' Perception of Learning Chinese Characters

Level of Agreement Students' Perception of Learning Chinese Characters	Percentage of Students (%)				
	Strongly Disagree	Disagree	Fair	Agree	Strongly Agree
1. I think learning Chinese characters is very important.	0	0	7.7	29.9	62.4
2. I find it difficult to learn Chinese characters.	1.7	12.0	35.0	37.6	13.7
3. I think learning Chinese characters is very interesting.	0	0	6.0	25.6	68.4

Table 1: Students' Perception of Learning Chinese Characters

Section B of the questionnaire focuses on students' perception regarding learning Chinese characters. The result shows that all 100% of respondents think that learning Chinese characters is both very important and interesting, which is undoubtedly an indication that students have the necessary motivation and initiative to learn Chinese characters through methods they deemed effective. Besides, 86.3% of respondents do not find difficulties in learning Chinese characters, whereas 13.7% think otherwise. Such a positive indication is worth further investigating, especially as it still occurs even under the challenges and obstacles of the implementation of online distance learning during the MCO period.

Upon analysis, there are a few factors that contribute to the above positive indications, where students find it important, interesting and not difficult to learn Chinese characters. First, students were already informed and reminded by teachers at the beginning of their Basic Chinese Language I course, in which the teaching and learning process of the course will be based on the principle of "prioritizing Chinese characters with Pinyin as auxiliary". The importance of such a principle should be realized and recognized by students before they even begin to learn basic-level Mandarin. Such a principle is also implemented concretely throughout the course, such as showing only Chinese characters without attaching the associated Pinyin in exam questions, and providing students with a sufficient quantity of Chinese characters practices or exercises (i.e. text copying, stroke order exercise, etc.) constantly and regularly. Consequently, students are more mentally and physically prepared to learn Chinese characters by upholding the principle.

The second factor that contributed to the above positive indication, is that UPM students enjoy higher freedom in choosing foreign languages that they truly prefer as their elective subject. UPM offers a total of eleven foreign languages, including Mandarin, Arabic, French, German, Japanese, Korean, Tamil, Myanmar, Thai, Turkish and Spanish, for students to choose. Therefore, it is safe to say that those who have chosen to study Mandarin in the end, are not unwilling or forced. Instead, they are likely to be more enthusiastic and show higher passion and commitment to learning Mandarin, which is undoubtedly very crucial in encouraging them to learn Chinese characters, regardless of their difficulties or intricacy. Yang, J. (2018) also suggested that the practices of learning characters and high motivation have a particular impact on the beliefs of learners, which is also a form of empowerment for these learners to learn Mandarin-speaking and Chinese character writing successfully.

Another contributing factor is that the Basic Chinese Language I course offered by UPM is three credit hours, which indicates longer teaching and learning hours, as well as sufficient class sessions allocated for students to learn Chinese characters. As stated above, the class sessions for the course are a total of 42 hours, in which students are required to learn 133 Chinese characters in the semester. Hence, on average, students are required to learn only three Chinese characters per hour, which is not an overload for both teachers and students, provided that the teaching and learning methods are practically effective.

B) Learners' Ability to Recognize and Read Chinese Characters

Level of Agreement	Percentage of Students (%)				
	Strongly Disagree	Disagree	Fair	Agree	Strongly Agree
Learners' Ability to Recognize and Read Chinese Characters					
1. I am able to differentiate Chinese characters with similar shapes.	0	12.0	41.9	37.6	8.5
2. I tend to write Hanyu Pinyin on the Chinese characters that I have learned before reading them.	1.7	10.3	27.4	38.5	22.2

3. I can type/write out the Chinese characters correctly after listening to it.	1.7	6.8	46.2	38.5	6.8
4. I can correctly pronounce the Chinese characters that I have learned.	1.7	5.1	36.8	47.0	9.4
5. I can remember the meaning of Chinese characters that I have learned.	0.0	3.4	22.2	47.9	26.5

Table 2: Learners' Ability to Recognize and Read Chinese Characters

Section C of the questionnaire focuses on learners' ability to recognize and read Chinese characters, based on their self-assessment and self-evaluation. The result shows that 88% of students believe that they are able to differentiate Chinese characters with similar shapes. Similarly, 88% of students tend to write Hanyu Pinyin on the Chinese characters that they have learned before reading them, while the remaining 12% are vice-versa respectively. On the other hand, 91.5% of students are able to type or write out the Chinese characters correctly after listening to it. 93.2% of students can correctly pronounce the Chinese characters that they have learned. 96.6% of students can remember well the meaning of Chinese characters that they have learned. All these results show that the majority of students have a well-established ability to recognize and read Chinese characters, with the assistance of Hanyu Pinyin as the pronunciation tool.

The overall data collected from Section B has illustrated a strong connection between memorizing a Chinese character and remembering its pronunciation. This indicates that when students are studying a character's pronunciation through Pinyin and tone, the tendency of writing Pinyin on the characters provides better assistance in their recognition and reading ability, which then leads to them having higher confidence to correctly pronounce the characters that they have learned and are able to comprehend the meaning of words and sentences. Hence, students are able to type or write out the Chinese characters correctly after listening to their pronunciation, which also contributes to their skill in differentiating various Chinese characters with a similar shape.

On the acknowledgement of the relationship between knowing the meaning of a word and knowing its pronunciation, experts such as Everson (1998) state that perhaps remembering characters by "emphasizing a purely visual processing mode may be too random and arbitrary to deal with large amounts of characters" (p. 200) for the students. A study performed by Sung (2014) also noted that "strategies which helped the participants learn phonological knowledge of characters, seem to be effective in aiding their performance in phonological comprehension" (p. 48), and that "phonological knowledge is an important element in assisting readers to identify the meaning of a character" (p. 49). Therefore, teachers should be encouraged to guide learners in attempting different character writing practices together with previewing or reviewing strategies that emphasize the Chinese characters' pronunciation, tones, and pinyin. Certain particular orthographic strategies which were deemed less effective in this study may even be more helpful for students to do well on their graphic comprehension and also the phonological production of a Chinese character, and students should be made aware of that as well.

It is also worth pointing out that even though there are 88% of the surveyed students that tend to write Pinyin on the learned Chinese characters before reading them, there is a higher percentage of students that can remember well the meaning of Chinese characters that they have learned and can correctly pronounce them. Based on this confidence, they are also able to reverse-engineer the same process, which allows them to recall the meaning and

pronunciation of that character itself. However, the regression in the percentage of students who are able to type or write out the Chinese characters correctly after listening to it, or are able to differentiate Chinese characters with similar shape, in contrast to the reading and understanding of Chinese characters may be related to the variation of their commonly used learning strategies as well. It is worth noting that the skill to differentiate Chinese characters with a similar shape is considered advanced level and may even be challenging to even native Mandarin speakers as well, let alone these beginner-level learners, due to the complexity and diversity in the constructions of Chinese characters.

C) Most Commonly Used Chinese Characters Learning Strategies that are Deemed Effective by Students Under Mandarin's ODL Sessions

12 Most Commonly Used Chinese Characters Learning Strategies	Component	Percentage of Students Deemed Effective (%)
1. Review words by going over lecture notes and example sentences.	Practice and review strategies	99.1
2. Listen carefully when the new character is first introduced.	Phonological strategies	97.4
3. Repeat the sound when the character is first introduced.	Phonological strategies	96.6
4. Pay attention to how the character is used in context.	Phonological strategies	96.6
5. Say the characters when writing it.	Orthographic strategies	95.7
6. Memorize the sound first, then the meaning and shape.	Orthographic strategies	94.0
7. Determine if one character in a new compound word has been learned before.	Orthographic strategies	93.2
8. Read the new character out loud and associate its sound with the meaning and shape.	Orthographic strategies	92.3
9. Say the character and visualize it.	Orthographic strategies	91.5
10. Review newly learned words by writing them many times.	Practice and review strategies	89.7
11. Look at strokes and associate them with a similar character already learned.	Orthographic strategies	88.9
12. Pay attention to stroke order.	Orthographic strategies	84.6

Table 3: 12 Most Commonly Used Chinese Characters Learning Strategies

Section D of the questionnaire focuses on the top 12 most commonly used Chinese characters learning strategies that are deemed effective by students under Mandarin's ODL sessions. Table 3 above shows the top 12 strategies according to the percentage of students deemed effective from the highest to the lowest. These strategies can be categorized into three main components, which are "practice and review strategies", "phonological strategies" and

"orthographic strategies". Practice and review strategies, as the name suggests, are the type of strategies students use repeatedly on learning how a character is written, spoken and used in sentences and in conversation. Phonological strategies can be defined as strategies that aim primarily on learning how a character or word is used orally in conversation, through learning the character's phonetic knowledge, such as its Pinyin, tone and pronunciation. Lastly, orthographic strategies can be defined as strategies that emphasize graphic comprehension, which involves understanding the combination of different components that forms a character, and graphic production, which leads to writing out the complete character correctly.

The data collected shows that 99.1% of students deemed reviewing words by going over lecture notes and example sentences, is the most effective strategy to learn Chinese characters. Following that are the three different phonological strategies that involve listening, speaking and understanding the meaning of characters when they are first introduced. However, it should be noted that these strategies are yet to include proper and detailed graphic comprehension and graphic production of a character. On the other hand, a wide variety of orthographic strategies are also welcomed and deemed effective by students. However, they were overall not deemed as effective as the practice and review strategies and phonological strategies which are ranked higher above. The orthographic strategies that are on the higher ranking also incorporate phonological features such as speaking and pronunciation as well. The strategies that are deemed least effective by students basically involve thorough observation, visualization and writing practice on the strokes and characters, which lacks the presence of phonological features.

From the analysis above, this study can deduce that students prefer using Chinese characters learning strategies that involve all three elements, which are the phonetic, orthographic and meaning system of a Chinese character at once. Students tend to feel more confident and comfortable to understand the meaning of Chinese characters when they initiate the learning process through the activation of listening, speaking and pronunciation skills as an auxiliary, instead of observing or visualizing the graphic component of the characters. Yang, T., & Gao, M. (2020) also cited and noted that "memory is greatly enhanced when new information is related to what is already known", and that "students benefited from the meaningful interpretation and chunking method in terms of memorization and immediate learning" in their study by learning the orthographic structure and the radicals. Hence, such commonly used strategies do shows consistency with the result analysis in Section C above, where at the earlier or beginning stage of Chinese characters learning, there is a higher percentage of students that are more confident in remembering well the meaning and correctly pronouncing the Chinese characters that they have learned, as well as the ability to write the Chinese characters correctly after listening to it, due to the recognition that such strategies are useful and show immediate results, thus they are willing to incorporate them more frequently in their study.

However, it is worth noticing that the most effective practice and review strategies, which refers to students reviewing words by going over lecture notes and example sentences, do not solely emphasize the observation and visualization skills that are crucial for graphic comprehension and graphic production of the characters. As evidenced by the data displayed in Table 3, not only orthographic strategies such as paying attention to stroke order and looking at strokes are deemed least effective, but practice and review strategies that involved learning and remembering newly learned words through repetitive writing practice also ranked lower than 90%. The study by Yang, T., & Gao, M. (2020) stated that although the method of meaningful interpretation chunking is best for enhancing short-term memory, repetition has more of an effect when it comes to promoting long-term memorization. Even though students deemed these strategies least effective due to the high requirement of time consumed and effort invested in

learning the graphic comprehension and graphic production of the characters, these orthographic strategies are still crucial for students to improve their ability to differentiate Chinese characters with a similar shape. Hence, this indicates that some students need to be further informed and encouraged that the frequent use of orthographic strategies is important in learning the writing and differences of Chinese characters, and should not be ignored or disregarded. Furthermore, combining a wider variety of strategies may enhance their oral, writing and recognition ability altogether effectively.

6. DISCUSSION

Understanding how non-Chinese beginner-level learners process and acquire Chinese characters is necessary for investigating the effectiveness perception of various Chinese character learning strategies. A model of visual Chinese character identification which was proposed and developed by Perfetti and Tan (1998), outlines the processes of how Mandarin learners come to recognize a character, when it is visually presented to them. Even though this model does not offer information about strategies learners should use to effectively acquire Chinese characters, it does identify essential knowledge learners need in order to recognize a character's form, meaning and pronunciation. The same study also explains that the model has three entities: the orthographic lexicon, the phonological lexicon, and the meaning system. When a character is presented to a reader, the reader first begins the stroke analysis, as strokes are the smallest units of a character. The detected stroke features activate the reader's orthographic lexicon. The orthographic lexicon then activates the phonological lexicon and the meaning system. In order to make the processes go from one stage to the next, the orthographic lexicon and phonological lexicon units need to exceed their thresholds. The orthographic lexicon threshold is determined by the frequency of occurrence of the printed character in the reader's daily usage, while the phonological lexicon threshold is determined by the frequency of access to the character's phonological form in the reader's speech experience. In conclusion, this model illustrates that stroke knowledge is the first step in character recognition, while orthographic and phonological knowledge assists readers to identify the meaning and pronunciation of a character.

All the strategies listed above in Table 3 were commonly used and deemed effective by students when a new character or word was introduced to them, and when they needed to further improve their comprehension of the new characters or words after the introduction. However, the deemed effectiveness of strategies, especially orthographic strategies, diminished gradually when students were at the learning stages from remembering to repeatedly practicing and reviewing the characters or words. This may be due to either students did not appreciate the importance of orthographic as well as practice and review strategies in these learning stages, or they were yet to fully understand the suitability of various strategies in different learning stages.

The result of this study shows a higher percentage of students deemed phonological strategies are more effective to learn and practice phonological knowledge of characters. While students used a wider variety of orthographic strategies to memorize characters' graphic knowledge and their association with their sounds, the deemed effectiveness of such strategies had decreased gradually, even though combining both types of strategies does assist students in acquiring phonological and orthographic features of characters. Perfetti and Tan's (1998) model identifies these two features as being important for activating the meaning system to comprehend characters, while Perfetti and Tan's (1998) model of visual Chinese character identification posits that one needs to know the orthographic information in order to activate the phonological information of a character, which is also in line with Everson's (1998) claim that there is a

relationship between recognizing a character and remembering its pronunciation. However, after the participants had learned the characters' phonological and orthographic features, they tend to use lesser practice and review strategies, which are supposed to help students to consolidate and strengthen their long-term memory and the ability to differentiate characters with similar shapes. Hence, the regression of deemed effectiveness of practice and review strategies particularly on the graphic comprehension and graphic production features, has also reflected a comparatively lower confidence in students to differentiate characters with similar shape.

7. CONCLUSION

This study found that all respondents think that learning Chinese characters is both very important and interesting, which is undoubtedly a positive and optimistic indication that students have the necessary motivation and initiative to learn characters through methods they deemed effective. Students were informed by teachers at the beginning of their Mandarin course, in which the teaching and learning process of the course will be based on the principle of "prioritizing Chinese characters with Pinyin as auxiliary". Therefore, the data collected overall indicated a strong connection between remembering a character and remembering its pronunciation. Such connection is reflected through students' higher self-confidence in their ability to correctly pronounce the characters that they have learned and are able to comprehend the meaning of words and sentences, and therefore improved their ability to type or write out the characters correctly after listening to its pronunciation. In addition, this study also deduced that students prefer using Chinese characters learning strategies that involve all three elements, which are the phonetic, orthographic and meaning system of a character at once. Students tend to feel more confident and comfortable to understand the meaning of Chinese characters when they initiate the learning process through the activation of listening, speaking and pronunciation skills as an auxiliary, instead of observing or visualizing the graphic component of the characters. However, the regression of deemed effectiveness of practice and review strategies particularly on the graphic comprehension and graphic production features, has also reflected a comparatively lower confidence in students to differentiate characters with a similar shape.

Based on the above findings, the study can conclude that students' most commonly used strategies that were deemed effective were more frequently used and suitable at the initial learning stage, but the deemed effectiveness of strategies gradually diminished at the later learning stages of remembering, practicing, and reviewing. The implication of such finding is that there may be a relationship between utilizing orthographic strategies to a greater extent and fully comprehending the various components of a character, which include graphic comprehension, graphic production and phonological production. These findings suggest more research questions and hypotheses for inspection in future studies. For example, what orthographic strategies other than the ones found in this study would assist students to acquire knowledge in different aspects of a character and are also deemed effective by them? What combination of various strategies can be considered useful and effective to learn Chinese characters? What will be of the findings and results yielded through different combinations of strategies explored in future studies? Since this study has its own unique learning background, situation, methods and participants, the above findings cannot be generalized due to such limitations, until more studies in various learning contexts are conducted. This study was limited in the size of participants and their language level. Future studies should further expand to include a higher number of participants with different language levels. This study is also limited geographically, as only students from UPM participated in this study, which may have excluded students with diverse

learning backgrounds who may use different learning strategies. Nevertheless, the findings and implications of this study will serve as a reference and an inspiration for subsequent research to further advance the field of Chinese character learning in Malaysia.

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