

Mobile Application and Traditional Approach for Chinese Stroke Order Instruction in Foreign Language Classroom

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ABSTRACT

Learning to write Chinese characters in the correct stroke order is important. However, it is rather challenging for learners especially non-native learners due to the complicated structures and the diversity of Chinese characters. Traditionally, rote learning has perceived as the most preferred used learning strategy in Chinese characters and it is highly recommended for the learners. Nonetheless, the rapid development of technology has changed the mode of learning. Mobile applications are utilized as media learning as it provides more opportunities for learners to learn everywhere and at anytime. This paper aims to investigate the impact of mobile app (MAs) and traditional method on Chinese characters stroke order learning. 100 students from the Faculty of Business and Management at UiTM (Sarawak), Mukah campus have been selected as participants for this study. The findings reported that both methods are able to help participants to pass the tests but the difference of both impacts is small. Although, the differences are not huge, but it is significant to tell mobile application might provide a better outcome compared to traditional method.

Keywords: *Chinese characters, stroke order, non-native learners, mobile Mandarin language learning, traditional method*

INTRODUCTION

As part of the Silk Road Economics Belt and 21st-Century Maritime Silk Road initiatives (Ting & Rijeng, 2018), Mandarin has become an economic commodity among people. The number of people to learn Mandarin increased dramatically. The tight diplomatic and economic relationship between Malaysia and China since 1976 has become one of the main reasons for Malaysians to learn Mandarin. Thus, most of the public universities in Malaysia offer Mandarin language courses for non-Chinese learners. Mandarin language courses are offered in both diploma and degree programs at University Teknologi MARA (UiTM), where all the students are non-native Chinese. The number of enrolment in Mandarin language courses by non-Chinese learners is growing every year. However, the increment in the number of enrolment does not reflect the rate of achievement among the students.

Referring to the curriculum for Mandarin language courses offered in UiTM, students are expected to acquire listening, speaking, reading and writing skills. The writing skills include Chinese characters writing. All students enrolled in Mandarin language course learn Chinese characters. Basic strokes of Chinese character writing, the rules of stroke writing and the structure of Chinese characters were introduced to students. A total of 68 characters needed to be learnt in 2 semesters. Nevertheless, based on the curriculum of Mandarin language courses offered in UiTM, diploma students are only required to attend the classes for 4 hours a week within 14 weeks in a semester. However, differences of writing system between Chinese language and European languages (French, Italian, German, English, Russian etc.) has caused confusion and frustrations to non-Chinese learners. Learners need to spend more effort or extra time to learn Mandarin due to particular elements of Chinese characters that do not exist in European languages. Freed (1995; 1998) compared the learning time of Chinese and Spanish learning among English speakers. The findings showed that English speakers take up to 2,000 class hours to learn Chinese language, however they only need 600 to 750 hours in the similar learning context while learning Spanish. Thus, a study on alternative Chinese characters learning strategies deemed as necessary to provide as references for non-Chinese learners to enhance their Chinese character learning.

STATEMENT OF PROBLEM

Many research revealed that learning Chinese characters is tough (Liu, 2014) especially in recognizing and writing the Chinese characters (Hoe, 2014) since learners must first understand the stroke and structure of the character before they could know the lexical and further their understanding to master the language. The understanding is crucial because when learners are learning Mandarin, they are learning its logographic system which is a totally different writing system from alphabetical writing system in English or Malay languages. If the understanding is absent, then, many negative transfers of previous language knowledge on alphabetical writing system would be obvious in their stroke order or Chinese characters writing as a whole and thus creating mistakes and errors in their writing (Ch'ng, Ting & Chuah, 2018). This is a daunting process which may turn down many aspiring learners.

Though some might argue that stroke learning in character writing is not compulsory or necessary for foreign language students as long as they are able to use Mandarin to perform simple tasks in daily life. However, in learning Chinese characters, learners must first understand the stroke and structure of the characters before they could further their understanding to master the language (Ch'ng, Ting & Chuah, 2018). Moreover, Chen, Yao and Jheng (2008) claimed that how to write it in the correct stroke order are important as stroke order will affect the fluency of continuing strokes writing, the structure, and overall shape. Therefore, stroke order plays a vital part in learning to write Chinese characters. However, writing Chinese characters in the correct stroke order among learners still underperform due to the complicated structures and diversity of Chinese characters (Tam & Luo, 2012). Therefore, a study on learning strategies in Chinese characters is deemed as necessary to provide more alternative strategies to improve the mastery of Chinese characters learning among non-native learners.

RESEARCH QUESTION OF THE STUDY

This research aims to explore the impact of mobile applications and traditional methods on learning Chinese characters stroke order among non-native learners. The three research questions addressed the following: 1. What is the impact of mobile applications (MAs) in learning Chinese characters stroke order? 2. What is the impact of well-known traditional method (rote learning) in learning Chinese

characters stroke order? 3. Which learning methods are more effective for the learning of Chinese characters stroke order?

REVIEW OF THE RELATED LITERATURE

Traditional Teaching and Learning Strategies on Chinese Characters

Chinese character has its own phoneme and each phoneme carries a different meaning. Traditionally, the Chinese instructions are mainly based on *LiùShū* (six writing) approach and semantic approach. Apart from that, Mandarin learners are often introduced to the high and frequently used characters, as well as, they are often advised to practice repetitively on characters to promote character recognition and memorization. Most of the research on Chinese characters learning strategies revealed that rote learning is perceived as the most frequent used to learn Chinese characters by the participants in many studies. McGinnis (1995) is the first to conduct the research on Chinese character learning strategies among the novice learners (Jiang & Zhao, 2001). In the study, 29 students' self-reported their characters learning strategies used during a five-week summer immersion programmed. The result indicated that the frequently used strategy in the programmed was copying repetitively. Wang's (1998) and Yin's (2003) surveys on the Chinese characters strategies also found the similar result as McGinnis (1995) in which rote repetition was the most frequently and preferred strategies used by the learners. Similarly, study of Goh (2016) also indicated that copying and memorizing the characters are the most frequent used strategies among non-native Chinese learners. In addition, Shen (2005) synthesized others' research (Taft & Zhu, 1995; Craik & Tulving, 1975; Stein & Bransford, 1979; Taft, Liu & Zhu, 1999; Shen, 2000; Cohen, 1998) and summarized that "rote memorization, graphic cues, context cues and knowledge of radicals are all used in learning characters" (as cited in Wang & Harris, 2016).

Some researchers conducted further investigation on the effectiveness of the chosen or preferable Chinese characters learning strategies among learners. Ke (1998) studied the influence of language background on the impact of Chinese character learning among first-year non-native Chinese learners. These learners have just completed a one year of study in Chinese language course. The findings revealed that paying attention on characters component (radicals, characters stroke sequences), repeat copying and pay attention on the graphic structure and semantic of the characters are the effective strategies for learning Chinese characters perceived by the majority of participants. In Wang and Leland's (2011) study on novice learners' perceptions of character learning strategies also supported Ke's (1998) studies in that the knowing orthographic features (radicals and rules of characters) helped them to acquire Chinese characters learning.

Additionally, Sung (2012) investigated the relationship between most frequently used strategies, factor underlying the use of these strategies and students' Chinese characters performance. 95 students from beginners through advanced learners were selected to participate in this study. The study reported orthographic-knowledge-based strategies are the most heavily used and accounted 6.8% for learners' character learning performance. Sung replicated the study among 88 first-year Chinese learners in the year of 2004. This study found that 30.22% of variance accounted by the participants' report strategy use, which was higher than the 6.8% compared to the study done in 2012. The previous studies mentioned above have clearly shown that learners tend to rely on the mechanical copying and mindless memorization of characters at the beginning stage of Chinese characters learning while they tend to focus on orthographic-based strategy after they have learned Chinese characters for several weeks. However, repeat copying characters does not seem effective in students' Chinese characters learning (Zhao & Jiang, 2002).

Mobile Mandarin Language Learning

While some researchers found that this traditional technique was perceived as most effective by learners to write the characters in the correct order (Wang, 1998; Yin, 2003), other scholars (Shinagawa, 2012; Chung, 2013) argued that learners may learn Chinese language best with the assistance of modern technologies. The research done by Shinagawa (2012) indicated that mobile application (MA) assisted learners to pick up non-western characters. This research provided a clue in which MA might be useful to develop learners' character writing and improve their writing order. Research carried out by Chung (2013) concluded that using iPad is a way to lead students to learn basic stroke order, structures of characters and gaining knowledge of the history and culture behind the words. Moreover, Chung concluded that iPad promoted the integration of learning Chinese into students' daily lives. Learners are more keen to practice basic stroke order using iPad for the reason of ease and convenience of using mobile device for learning. Other studies (Chang & Hsu, 2011; Rahimi & Miri, 2014; Soleimani & Mustafa, 2014) concluded that with assistance of mobile applications, learners demonstrated higher achievement and motivation.

Research by Chua, Tan and Lin (2015) explains the challenges encountered by Malaysian non-native learners when learning Chinese characters. He also mentioned the integration of technologies in Chinese characters learning brings a great impact in learners' performance. Hulls (2005) indicates that learning Chinese characters by using tablet PCs made students to be more focus in the class. The use of different colors to show the strokes of Chinese characters also captured the attentions of the learners. In the study of Hulls (2005), the advantages and disadvantages of traditional teaching equipment and tablet PCs were compared. Chu and Toh (2015) introduced the interactive character learning model (ICLM) to Malay L3 learners from beginner level to advance level. They found that Malay L3 learners show more interest and give faster responses in sentence making when learning Mandarin with Chinese characters. Learners' ability in recognizing the correct characters and making sentences has increased after the introduction of ICLM. Studies done by Wang (2013) as well as Zhang and She (2006) mentioned that American beginning Mandarin learners were surprised with the connections between phonetic system and Chinese characters when they try to type pinyin with computer. This may promote the Chinese characters learning motivation among the learners apart from arousing the awareness of orthographic rules.

A research by Chuang (2016) mentioned that there are more than 40 Mandarin language learning applications that have been developed and made available in iOS or Android system at the moment with the significant increase usage of mobile assisted language learning applications. Chuang categorized these Mandarin learning applications as dictionary, flashcard, Chinese alphabet (pīnyīn), game and Chinese characters. He mentioned that they are more than 20 Chinese character learning applications currently available in *Google Play Store* and *Apple App Store*. Based on the previous studies mentioned above, the use of mobile application motivates learners and enhances their performance in their Chinese characters learning. Nonetheless, most of these research focus on the recognition of Chinese characters. Research on the use of mobile apps for writing Chinese characters in the correct order is rather scarce. This study is thus essential to explore the impact of mobile application for the learning of Chinese characters stroke order among non-native learners.

METHODOLOGY

This section discussed the selection of participants, instrument and data collection framework in this study.

Selection of Participants

The participants in this study were selected based on the purposive sampling from the total population of non-Chinese students who have enrolled in Foundation Mandarin (Level II) at Universiti Teknologi MARA (Sarawak), Mukah campus. These students had gone through and passed level 1 of Foundation Mandarin course in previous semester. There are approximately 100 students that have been selected as the participants for the study. These students studied 4 hours of Foundation Mandarin (Level II) per week. The participants were divided into two groups equally, about 50 participants for control group (CG) and treatment group (TG) after the pre-test. 50 participants in CG were asked to practice characters stroke order writing in traditional way which is rote learning method. They were required to do their character stroke order practice routine using the writing exercise book pre-determined by the course for 3 weeks. Another 50 participants in TG were asked to use top 3 ranked existing mobile application pre-determined by the study to practice Chinese characters stroke order routine for 3 weeks.

Instrument

A Chinese character stroke order writing test was developed in order to achieve the purpose of the study. There are 20 items in the writing test which are randomly selected from writing exercise book of Foundation Mandarin (Level I & II). Mobile applications chosen for the Treatment group in this study was based on the first top three ranked mobile application available in both *Google Playstore*, which cater for Android mobile phone user and *Apple App Store*, which cater for i-Phone series user. The existing mobile applications for Chinese characters stroke order learning or practices are shown in Table 1 below.

Table 1: Selected Mobile Applications (Mas) in This Study

No	Name	Logo	Rankings	Downloads
1	Chinese Skill- Learn Chinese		4.8	1 million
2	Chinese Writer		4.2	100 thousands
3	How to write Chinese Word		4.0	100 thousands

The MAs chosen shares the same characteristic that traditional classroom might not be able to perform such as provide the feedback for user while the mistake of stroke order was made. The feedback provided might help user to increase the awareness of the mistake made in Chinese characters writing. Participants from TG were asked to download the applications before the lectures and a list of Chinese characters will be given during the lectures. Participants were required to practice the Chinese characters stroke order based on the Chinese characters list. However, participants from CG were asked to practice the Chinese characters' series of sequence or steps in the exercise book. A Chinese character list is exactly the same as the list that was given to participants in TG.

Framework of Data Collection

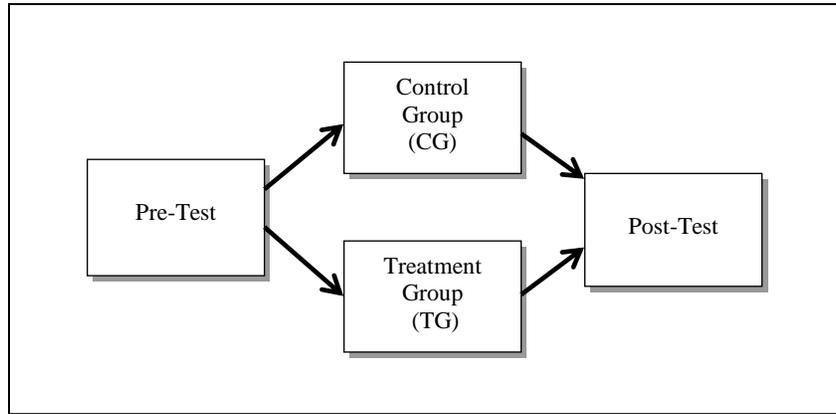


Figure 1: Data Collection Framework

Pre-Test

Participants were asked to complete the Chinese characters stroke order writing test by showing the Chinese characters' series of sequence or steps in the pre-test as to allow the researchers to identify the problems or errors in their Chinese characters stroke order writing.

Post-Test

Participants from CG and TG were asked to complete the post-test after practicing the Chinese characters stroke order for three weeks. The test instructions and test items are exactly the same as in pre-test. The test scores of pre-test and post-test were computer analysed and the improvement of practice was compared.

Table 2: Word List of Stroke Order Writing Test

下	好	因	病	爸	四	饭	起	早	太
我	小	语	午	月	没	医	他	为	不

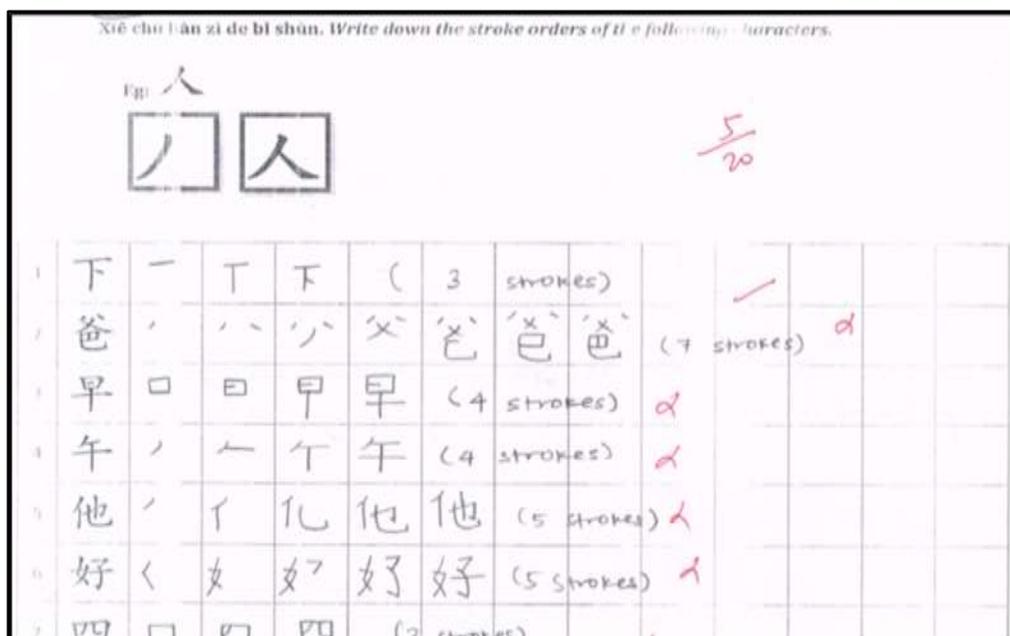


Figure 2: Sample of Stroke Order Writing Test

RESULT AND DISCUSSION

The results of the study are reported and discussed according to the three research questions of this study.

The first research question in this study is “What is the impact of mobile applications (Mas) in learning Chinese characters stroke order?” Figure 3 illustrated the performance of learners from treatment group. These learners learnt characters stroke order writing from the selected mobile apps. The results indicate that there is an increase in the number of learners who passed the post-test (n=40) compared to the pre-test (n=28) after the use of mobile apps in the learning. In comparison, the number of failures in the post-test is lower (n=8) when compared to the pre-test (n=20).

From the results, it can be inferred that the use of mobile apps has positively influenced their learning of character writing. Accordingly, the treatment has successfully reduced the failure rate in the post-test. The results of this study show that mobile apps provide added-value in helping learners to write Chinese characters in the correct sequences. The finding is consistent with existing literature that supports the integration of mobile phones in and out of the classroom to enhance students’ learning and academic performance (Ng, Luk & Lam, 2016). The study conducted by Ng, Luk and Lam (2016) found that there is a positive relationship between social mobile application usage and academic performance. In short, the use of mobile applications improved and enhanced the learners’ performance in the pot-test.

To answer second research question, i.e. What is the impact of well-known traditional method (rote learning) in learning Chinese characters stroke order? The performance of control group was analysed and shown in Figure 4. Figure 4 demonstrates the achievement of learners from control group who learnt character writing via traditional classroom instructions. The figure shows that there is an increase in the number of learners who passed the post-test. The results indicate that traditional classroom teaching has improved the number of passes in the post test (n=35) as compared to the pre-test (n=25). As a consequence, the number of failures in the control group has been reduced. The learners in the control

group utilized the traditional Chinese characters learning strategies that resemble rote learning that may improve or enhance strokes order of Chinese characters learning.

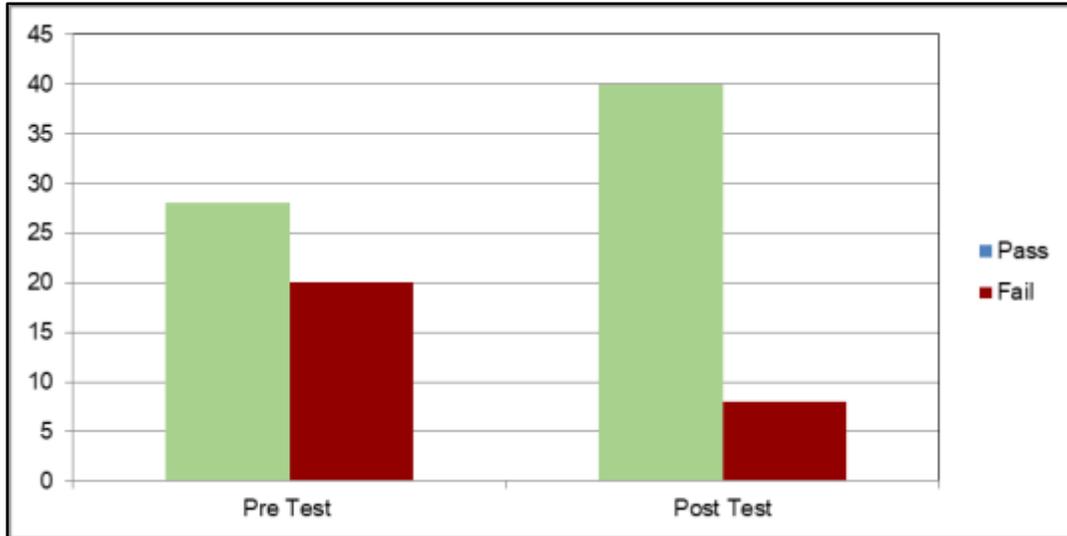


Figure 3: Mobile Application- Performance of Treatment Group in Pre and Post-test

The students practice writing the Chinese characters stroke orders by copying repetitively. The results also show a positive outcome on the use of traditional learning strategies. This finding is aligned with McGinnis's (1995) and Ke's (1998) studies which revealed that repeat copying is perceived as effective strategies for Chinese character learning. The findings from the control group also shows a positive impact of traditional method on learning to write Chinese characters in the correct order.

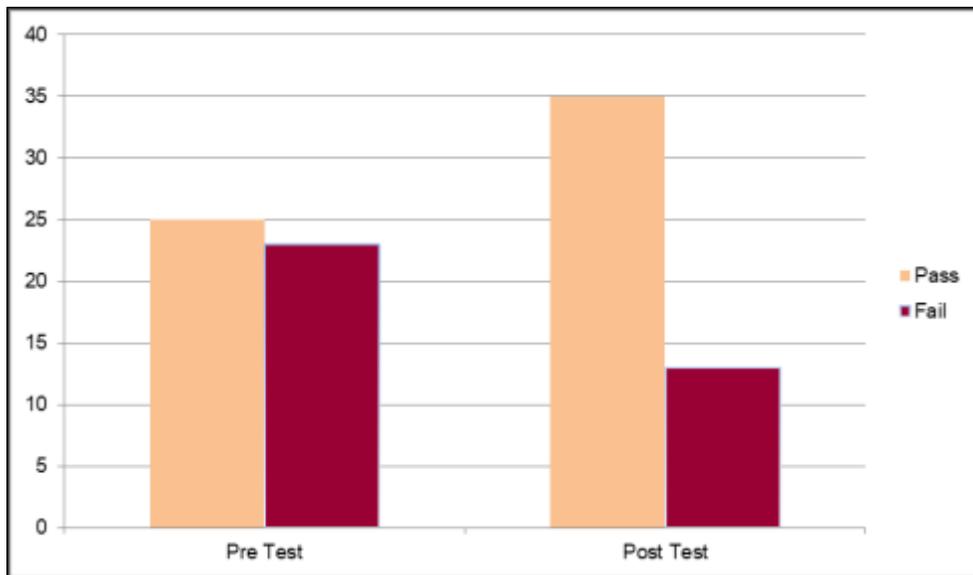


Figure 4: Rote Learning- Performance of Control Group in Pre and Post-test

In term of responding to research question three, comparison of performances for both control and treatment groups in learning Chinese character stroke order writing was carried out in this study and the result is as shown in Figure 5. Generally, the instructions received by the learners in both groups are effective as shown by an increase in the number of passes in both post-tests. The post-tests for both the control and treatment groups also indicate a reduction in the number of failures.

Although, there is a general sense that both the traditional and mobile apps learning produced positive results in the post-test, Figure 5 shows that the increase in the number of passes for the treatment group is higher, i.e. pre (n=28) and post-test (n=40) than the control group, i.e. pre-test (n=25) and post-test (n=35). Also the number of students who failed in both post-tests is lower for treatment group, i.e. pre (n=20) and post-test (n=8) than the control group, i.e. pre (n=23) and post-test (n=13). The results show that the numbers of students who failed in both tests are lesser in treatment group than in control group.

The figure demonstrates that the improvement in control group and treatment group is 25% and 20.8% respectively. The results for comparison of treatment and control group show a minimal difference in improvement for the passing rate which is only 4.2%. While mobile apps have been linked to improved performance, the effectiveness of teaching method in the treatment group does not significantly boost their learning to write Chinese characters stroke order.

The results for comparison of both TG and CG are somehow consistent with Chang and Hsu, 2011; Kim and Kwon, 2012; Rahimi and Miri, 2014 and Soleimani and Mustaffa (2014) who suggested that students in the MALL group demonstrated higher achievement and motivation (as cited in Chuang, 2016). In addition, Shinagawa (2012) also argued that MA can be useful to develop the learners' writing of Chinese character and improve their stroke order writing. However, the difference in passing rate between both treatment and control group in this study shows only a small improvement of 4.2%. The small difference of the passing rate suggests that the traditional learning strategies are equally important role to play in the learning of Chinese characters stroke order among non-Chinese learners.

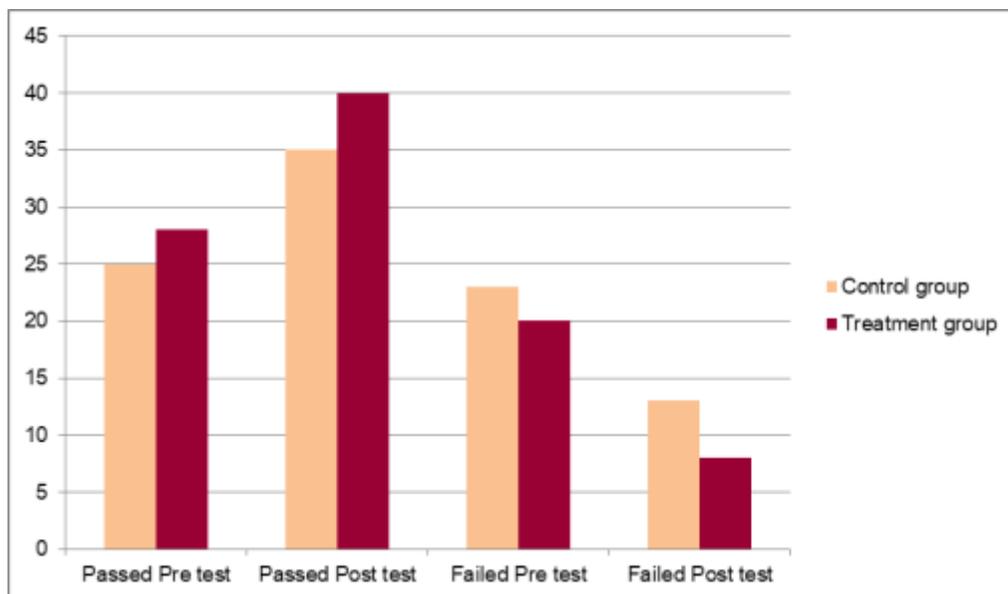


Figure 5: Comparison of Performance for Both Control Group and Treatment Group in Their Pre and Post-tests

CONCLUSION

To conclude, the results of the study reveal positive impacts in the improvement of the participants' stroke order writing either using traditional method or mobile apps. However, the improvement rate of participants who used mobile application is 25%, which is slightly higher than those who used traditional method, 20.8%. Although the differences of improvement rate between these two methods are not huge, which is only 4.2 %, but it is significant enough to tell which method might provide a better outcome. In comparison, traditional method is laborious and less effective (Zhao & Jiang, 2002) and a repetitive process for an educator whenever a new set of words is introduced to the students. Practically, since the set of vocabulary is fixed for each learning level, mobile apps have shown to provide more motivation and improvement (Chang & Hsu, 2011; Kim & Kwon, 2012; Rahimi & Miri, 2014; Soleimani & Mustafa, 2014; Shinagawa, 2012). Therefore, more mobile apps that suit the learning level of the learners are suggested to be produced to improve the acquisition of Chinese characters stroke order writing. When students use mobile apps for self-learning time, more time can be spent on other teaching components, such as to improve learners' comprehension, accuracy and mastery of the target language.

It is recommended to include larger sample size in the study as to promote more accurate findings that can be generalized on the larger population. Exploring personal preferences of learning methods for writing stroke orders as a way forward to cater for the individual needs of each learner should be taken into consideration and addressed in future studies.

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