

MEPCP: An Effective Game-Based Learning for Mandarin Endocentric Phrases

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ABSTRACT

This study is to investigate the effectiveness of using Mandarin Endocentric Phrases Crossword Puzzle (MEPCP), an online game-based teaching tool, to teach Mandarin Endocentric Phrases (MEP) in Mandarin classrooms. Game-based learning is widely acknowledged as an effective method to increase engagement among learners in foreign language classrooms. Within this backdrop, MEPCP was created to enable learners to experience the structuring of correct MEP in an engaging way. This study explores the efficacy of MEPCP in achieving the mastery of MEP. 155 students responded to 28 items on a 5-point Likert scale questionnaire. Data analysis was done using SPSS version 24. Findings reveal that the students learn MEP more effectively via MEPCP. It is also evident that MEPCP is easily accessible and user friendly. Besides being learner-centred and entertaining, results indicate that it provides immediate feedback to the students. The conclusions underline that being grounded in the constructivist paradigm, MEPCP enables learners to experience content under authentic circumstances. This suggests the implementation of MEPCP helps to improve students' Mandarin communication skills, thus nurtures holistic individuals who can realize the aspirations of the Malaysian education system.

Keywords: MEPCP, Game-Based Learning, Mandarin Endocentric Phrases, students' engagement

INTRODUCTION

Background of Study

Nowadays, learning can take place in many ways and can result in more unexpected outcomes. The pandemic has increased the need for online learning in many courses and devices used for online learning are primarily selected as a learning tool by learners to improve their understanding. According to Rahmat (2021), in the design of content delivery, the teachers are encouraged to make it fun and interactive, by including some form of online gaming elements. The idea is supported by Bressler, Oltman & Vallera (2018) who mentioned that one of the most powerful functions of games is facilitating social learning, or social constructivism. Simply put, constructivism emphasizes the need to supply students with the necessary tools so that they can decipher their own processes to solve a problem. This indicates a participatory process where students interact with their environment to solve the learning problem that is put forward to them. Game-based learning has gained much interest in educational settings in the last 20 years (Connolly et al., 2012; Li and Tsai, 2013; All et al., 2014; Westera, 2015; Boyle et al., 2016; McLaren et al., 2017). Game-based learning has been acknowledged as a powerful tool in motivating digital environments, due to its potential to enhance student engagement and motivation for online learning (Papadakis et al., 2020). Besides motivating and engaging learners, game-based learning can sustain learners' interest in learning for prolonged periods (Supri et al., 2019).

Game-based learning now plays a vital role in education, including the teaching and learning of Mandarin. Learning Mandarin can be very difficult for some people due to the complexity of pronunciation, grammar and Chinese characters. Games provide motivation and immediate positive feedback to learners, thus increasing their interest in learning the language. A study by Ying et al. (2021) examined the use of online-flash card in the teaching of Mandarin to 5th grade students at an elementary school in Indonesia. The findings revealed that students liked learning Mandarin by using flashcards. Also, the 5th grade students' Mandarin scores increased after learning Mandarin using flashcards. Another study by Lee & Mohd Yusof (2021) in Malaysia, revealed that the LiSCReW board game was as an effective educational tool for learning Chinese characters among non-native speakers.

Due to the different characteristics of Mandarin and its native language, non-native speakers often encounter grammatical problems when learning Mandarin. In order to achieve the best learning results, teachers are always looking for suitable teaching methods. Game-based learning is a good option as it allows learners to actively participate in classroom activities and enhances their interest and motivation. This study investigates the use of crossword puzzles by Malay students in learning Mandarin Endocentric Phrases (MEP) in a public university in Malaysia. It explores the effectiveness of crossword puzzles in acquiring MEP when non-native speakers learn Mandarin.

Statement of Problem

According to Alyas and Genc (2016), new technologies including digital game-based language learning have increasingly received attention among educators. Ideally, game-based learning is an essential method that should be incorporated in foreign language classrooms to increase engagement among learners. This method, when devised meaningfully, will subsequently develop

language competency of the learners efficiently in many aspects, including the mastery of grammar and communication skills. However, the way in which language games are developed and introduced to meet explicit objectives remains a challenge in language classrooms.

In the teaching of Mandarin language to the non-native speakers in Malaysia, game-based activities are rarely adopted in the classroom due to various circumstances. In realizing the missed opportunity, the Mandarin Endocentric Phrases Crossword Puzzle (MEPCP), an online game-based teaching tool was created to enable learners to experience the structuring of correct MEP in an innovative way.

The crossword puzzle development was guided by findings from the research on error analysis in MEP among Malay students in Universiti Teknologi MARA (UiTM) Shah Alam campus (Mok et al. 2019a). According to the researchers, most of the undergraduate students in UiTM are at the beginner stage of learning Mandarin as their foreign language. They are inevitably influenced by their mother tongue which is the Malay language. Therefore, they often make mistakes in the process of learning Mandarin, particularly MEP. The MEPCP was designed as part of a teaching strategy initiative to overcome this problem. This study is conducted to investigate the effectiveness of MEPCP in achieving the learning outcomes of MEP.

Objective

The main objective of this study is to examine the use of MEPCP in the learning of Mandarin. Particularly, this study explores the effectiveness of MEPCP in achieving the mastery of MEP among the Malay students in learning Mandarin.

Research Questions

Specifically, this study aims to answer the following research questions:

1. What are the students' perception towards MEPCP?
2. How does MEPCP influence students to learn MEP?
3. How do students perform when playing MEPCP?

LITERATURE REVIEW

Introduction

This part includes the description of Mandarin Endocentric Phrases (MEP), discussion on the teaching of MEP to Mandarin non-native speakers, game-based learning in education and the advantages of game-based learning.

Description of MEP

MEP is one of the usual but essential Mandarin grammar phrases or “duǎnyǔ 短语”. “Duǎnyǔ” is interpreted as a group of words without punctuation and following certain structural rules (Huang & Liao, 2012). The different types of “duǎnyǔ” are formed by different rules of word formation. “Piānzhèng duǎnyǔ 偏正短语” (Endocentric Phrases) is a type of “duǎnyǔ”, classified according to its internal structure (Yang & Ying, 2011). It consists of two components that share a [modifier-center] relationship. The modifying component is located before the central word it modifies. The role of the modifier is to describe or restrict the central word.

In the construction of a Nominal Endocentric Phrases (attributive + noun), the auxiliary “de” is inserted in between the attributive and the noun. For example, in the phrase of “hóngsè de xiézi” (red-de shoes, red shoes), “xiézi” (shoes) is the noun; the attributive “hóngsè” (red) describes the colour of “xiézi”. This literally translates to “red’s shoes” or “shoes in red colour”.

Teaching of MEP to Mandarin Non-native Speakers

Up to now, there is a void in studies involving the teaching of MEP among the non-native speakers. In the research on the error analysis in the use of MEP among Malay students (Mok et al. 2019a), it was found that the major errors made by the Malay students in their learning of MEP are: (1) omission of the measure words, (2) reversed string order of the MEP, (3) errors in using demonstrative pronouns, and (4) excess of the auxiliary “de”. To solve these problems, a few teaching methodologies were proposed with focus on rectifying the students’ weaknesses. One of the effective methods suggested by the researchers is a Five-Step Technique where the learners were guided to construct correct MEP by placing the word according to the sequence: (1) demonstrative pronoun, (2) measure word, (3) adjective, (4) auxiliary “de”, and (5) noun (Mok et al. 2019b). However, the effectiveness of learning MEP can be enhanced through many more innovative ways, and the game-based learning is one of them.

Game-Based Learning in Education

Definitions of game-based learning principally point out that it is a type of game play with defined learning outcomes (Shaffer et al., 2005). There is an ongoing debate among scholars as to the exact definition of a game, and especially what is not a game. Even though the debate around how games are defined cannot be settled, but Plass et al. (2015) state that this may not be a problem, as play—the essential activity in games—has long been thought of as a critical element in human development.

Ke et al. (2016) also concur that the promise of using games for learning is that play- and learning-engagement can develop cohesively as a whole to produce a highly motivated learning experience. In the findings of study, they suggested that game-based learning engagement is an integrated and continuing process that advances from affective engagement driven by optimal challenge, cognitive engagement situated in playfulness, to potentially game action-based content engagement.

According to Schrier (2018), game-based learning normally involves using games for some type of educational purpose – such as a non-digital card game that features historical figures, a digital drawing game that supports creativity, or a word puzzle game that teaches Spanish. Occasionally a game can be a central part of a classroom lesson and other times a game may be a shorter activity that inspires students to think. However, what it meant by “game-based learning” continues to evolve, and the role of information technology in creating game-based experiences, is also varied, and evolving.

Vnucko & Klimova (2023) mentioned that research has shown that digital games are very popular among all age groups, including when they are used in foreign language education, such as Digital Game Based Vocabulary Learning (DGBVL). The main findings of their study showed that DGBVL can create a positive learning environment. In this environment, students primarily experience positive emotions, which in turn may improve their vocabulary recall. The researchers

recommended the use of DGBVL in vocabulary learning as it may go beyond traditional teaching methods in the English classroom. The results of this study can be used as a basis for further research that may eventually lead to the implementation of DGBVL in the English language teaching process.

Advantages of Game-based Learning

In the study of Cheng & Su (2012), the researchers developed a game-based learning system to improve self-efficacy for student's learning. The game-based learning was incorporated with educational and information technology. From the e-learning conducted, it was revealed that the game-based learning was getting more attention. In game-based learning, the course content was mapped into the game to provide a real-world experience, the repeated self-learning, and the ongoing interaction and feedback elevated the learning interest and motivation. Thus, game-based learning could reach the goal of learning effectively. The findings indicate that the learning motivations of students have significant impact on the learning achievement, and the learning achievements of students with game-based learning are better than those who use the traditional face-to-face teaching.

Lai et al. (2012) used an operating system to design their course and added game elements to the course so students could play games during the contextual learning sessions. At the end of the game, students were asked to fill in feedback forms and were interviewed. A game questionnaire was also designed to measure how engaging the course was for the students. The results of the experiment proved that adding a game element to the operating system course increased the attractiveness of the course to the students, who were willing to spend time on the course because they wanted to win, thus achieving a boost in motivation to learn.

Cheng et al. (2012) designed an online competitive game-based learning system by using freeware for junior high school students and to evaluate its effectiveness in a study. After the system was established, it was implemented in a 10-week teaching experiment. A total of 35 junior high school students participated in this teaching experiment. Both pre-test and post-test were administered and analyzed. A 5-point Likert scale questionnaire, containing domains of system operation, learning effectiveness, competition and incentive, and training room learning was also included to assess the user's satisfaction. Descriptive analysis and independent t test were used to analyze the collected data. The findings of the study indicate that most students were satisfied with the four domains of the freeware constructed online competitive game-based learning system. Simultaneously, the online competitive game-based learning system was effective for junior high school students' learning.

In the study done by Ying et al. (2016), the authors introduced an easy way to learn Chinese language using mnemonics through mobile game. This method was implemented among primary school students. Some of them felt learning Chinese language was difficult, especially learning the Chinese characters. Chinese characters will seem strange to the beginner who are trying to learn the Chinese language. It can reduce children's motivation to learn. Thus, the authors harnessed technology to learn Chinese language via mobile game. Chinese language learning through game became a better solution for the children than traditional learning. The findings of this study suggest that creating game learning with mnemonics, the strategy to remember, which includes many techniques can help learners to learn Chinese characters. This method would be more

effective if presented in the form of educational games.

Sundaram & Ramesh (2022) studied the efficiency of a game-based joyful blended learning approach to learn Chemistry during COVID-19 among 240 students studying the tenth standard in 4 different private CBSE schools in Palakkad district, Kerala, India. The main objective of the study was to help secondary school students to learn science-related concepts by engaging in an educational card game and using digital media to learn concepts. The educational benefits of the game in terms of learning performance were examined, as well as students' perceptions of its integration into scientific learning. Findings indicate that students developed positive attitudes towards the use of educational cards for learning Chemistry. The study concluded that the development of a game-based, joyful blended learning approach fosters reflective thinking and independent learning in students.

METHODOLOGY

Research Design

This quantitative research explores how effective game-based teaching tool can help students to construct correct MEP in an innovative way. 155 students responded to 28 items on a 5-point Likert scale questionnaire. The SPSS analysis of the questionnaire shows that the Cronbach Alpha is 0.97. Thus, table 1 reveals significant internal validity of the instrument.

Table-1. Cronbach alpha for instrument.

Reliability Statistics	
Cronbach's Alpha	N of Items
.970	28

Research Procedure

Crossword is an education game that promotes mental sharpness. It is also a good teaching tool that can help students understand words and their meanings. The following is a procedure for conducting a game-based learning of MEP session.

1. Select a few MEPs and create blanks in them. These will then become clues to assist the participants in completing the crossword puzzle.
2. Use Hot Potatoes J Cross Software Version 7 to develop the crossword puzzle.
3. Publish the MEPCP.
4. Introduce MEPCP to students, students can access MEPCP via mobile phones or laptops.
5. Present a set of formal questionnaires to students for feedback.
6. Collect data and analyze the data.

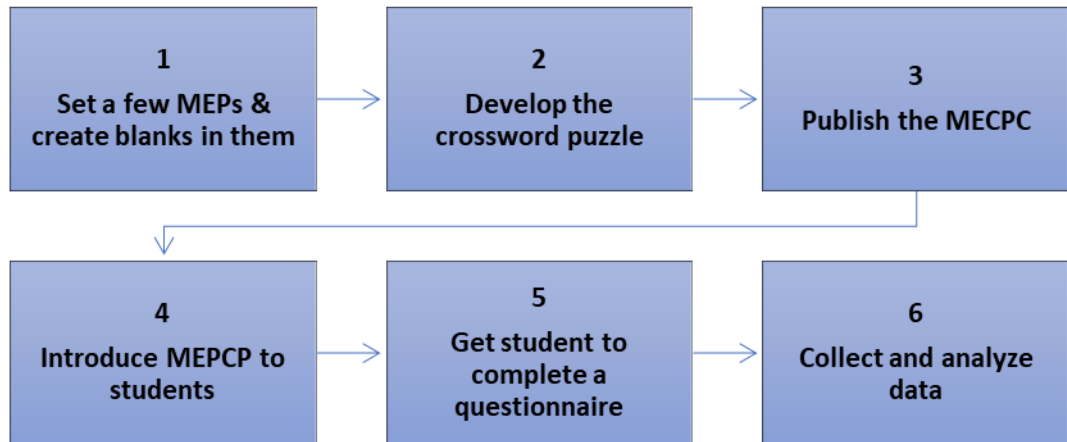


Figure-1. Research Procedure

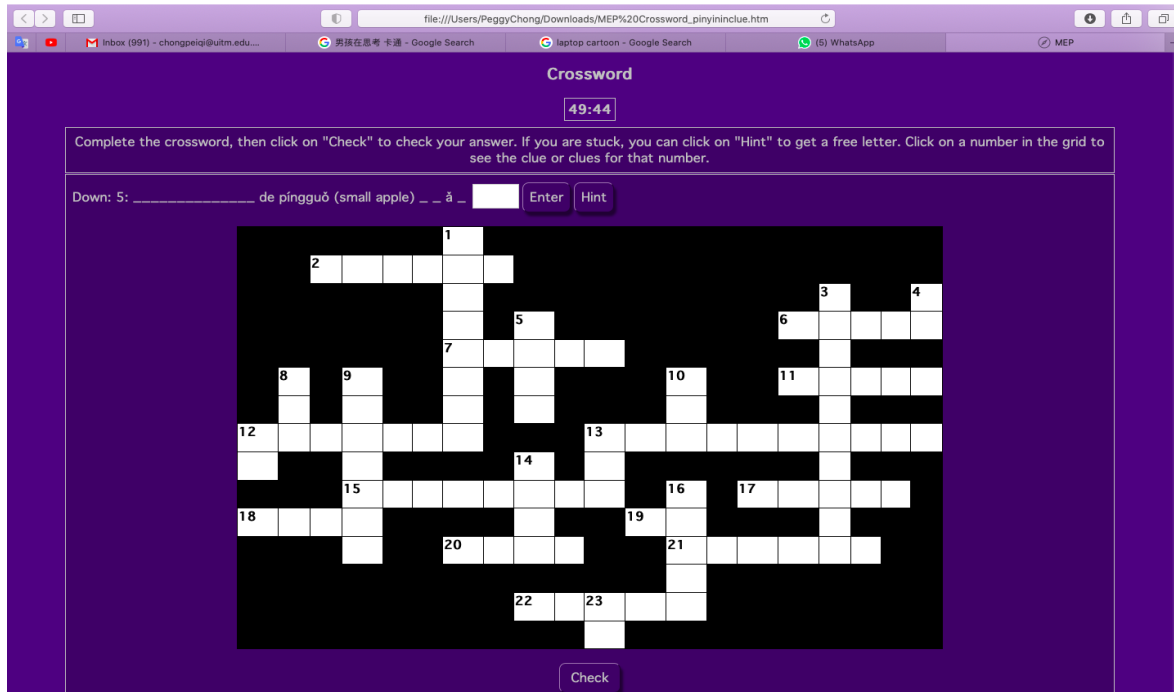
Design of MEPCP

The MEPCP is a learner-centered design. 23 MEPs are selected and allocated into 13 columns and 10 rows in a crossword puzzle. Students have 50 minutes to complete the crossword puzzle. To help students, a clue to complete each MEP is given in English.

Example :

Across : 2 Yi bēi __ __ ǒ __ __ ī (A glass of fruit juice)

Down : 1 Piányi de __ __ ǒ __ __ ǎ __ (cheap watch)



Complete the crossword, then click on "Check" to check your answer. If you are stuck, you can click on "Hint" to get a free letter. Click on a number in the grid to see the clue or clues for that number.

ACROSS		DOWN	
2	Yì bēi ___ ò ___ ī (A glass of fruit juice)	1	Piányi de ___ ò ___ ā ___ (cheap watch)
6	___ ē ___ è de yuánzhūbǐ (black pen)	3	Yì pán ___ ē ___ ā ___ à ___ (A plate of nasi lemak)
7	Zhè gè ___ ē ___ (This glass/ cup)	4	___ è de lāchá (hot teh tarik)
11	Hóngshè de ___ é ___ (Red shoes)	5	___ ā ___ de píngguǒ (small apple)
12	Piàoliang ___ shòubiǎo (beautiful watch)	8	Yì ___ ē ___ kěkǒukělè (a glass of coca-cola)
13	Liǎng ___ ā ___ jiǎnrǔ (two bowls of chendol)	9	Wú gè ___ í ___ ò (five apples)
15	Nà wǎn ___ ā ___ í ___ à ___ (That bowl of curry noodle)	10	Zhè ___ á ___ chǎofàn (this plate of fried rice)
17	Zhè bēi ___ ā ___ ē ___ (This cup of coffee)	14	Sān ___ à ___ yīfu (three pieces of clothing)
18	Hóngshè de ___ ī ___ (red clothing)	16	Yì wǎn ___ à ___ ā (a bowl of laksa)
19	___ à de xīguā (big watermelon)	23	Zhè ___ è bábǐng (this piece of popiah)
20	___ ě ___ de Zhōngguóchá (cold Chinese tea)		
21	Liǎng ___ ā ___ xiézi (two pairs of shoes)		
22	Bàn gè ___ ī ___ ā (half of a watermelon)		

Figure-2. MEPCP

Method of Data Collection

The data was collected through Google forms from students who completed a Mandarin class, randomly selected by the researcher. 155 Malay students from UiTM Shah Alam campus and Puncak Alam campus who have taken the Introductory Mandarin 2 and Introductory Mandarin 3 courses were selected as the survey respondents.

Method of Data Analysis

The research instrument in this study was an online questionnaire, it contains 5 sections. The first section has questions about the respondents' demographics. The second section has questions about Game Design, the third section contains questions about Constructivist Learning & Cognitive Development, the fourth section has questions about Learner-Center Design and the last section contains questions about Learning Interest. The questionnaire was adapted from the Gameful Experience Questionnaire (GAMEFULQUEST) (Högberg et al., 2019) which can be used to measure individual user's gaming experience, and from a questionnaire designed by Salter et al. (2012) to investigate students' perceptions of online interactive game learning. The questionnaire of this study was a set of 28 items and the respondents were asked to rate each item on a 5-point Likert scale ranging from 1 to 5 ('Strongly Disagree' to 'Strongly Agree'). The collected data was analysed using SPSS version 24 to show the frequency of responses in the form of mean score. Findings are presented according to the research questions using bar charts.

FINDINGS

Introduction

This section presents the findings of the study. The finding is presented based on the research questions. The research questions are:

1. What are the students' perception towards MEPCP?
2. How does MEPCP influence students to learn MEP?
3. How do students perform when playing MEPCP?

The perception of students towards MEPCP

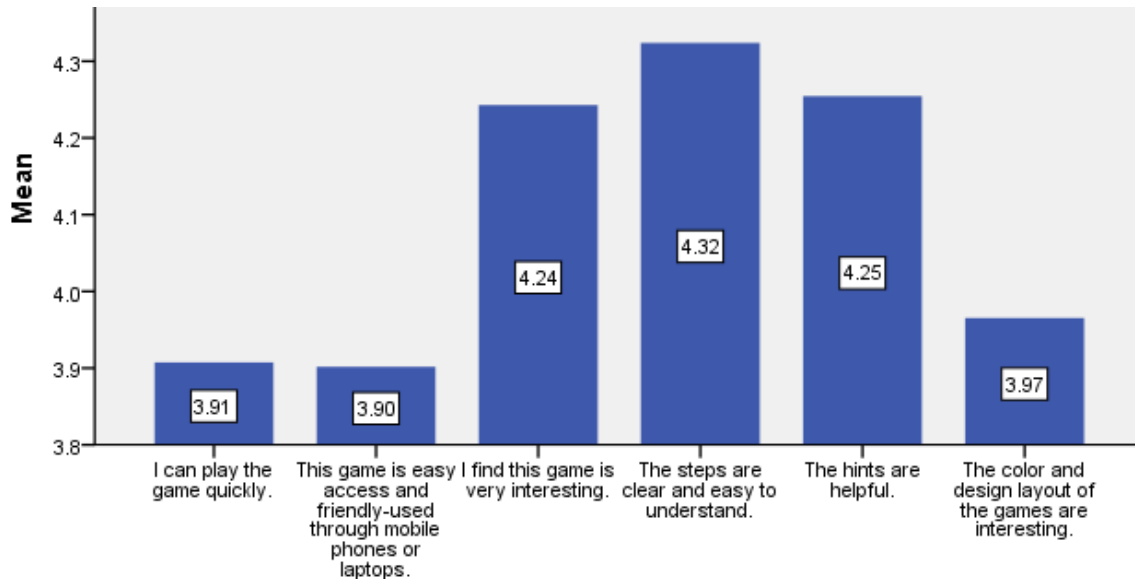


Figure-3. Mean for students' perception towards MEPCP

Figure 3 presents the mean for students' perception towards MEPCP. Generally, students agreed that MEPCP has many advantages, such as “the steps are clear and easy to understand” (4.32), “the hints are helpful” (4.25), “the colour and design layout of the game are interesting” (3.97). Thus, they found “the game is very interesting” (4.24), they “can play the game quickly” (3.91) and “the game is easily accessible and user-friendly through mobile phones or laptops” (3.9).

The influence of MEPCP on students' engagement to learn MEP

The students' engagement to learn MEP through playing MEPCP is analyzed based on two perspectives: (i) constructivist learning and cognitive development, and (ii) learner-centred learning.

(i) Constructivist learning and cognitive development

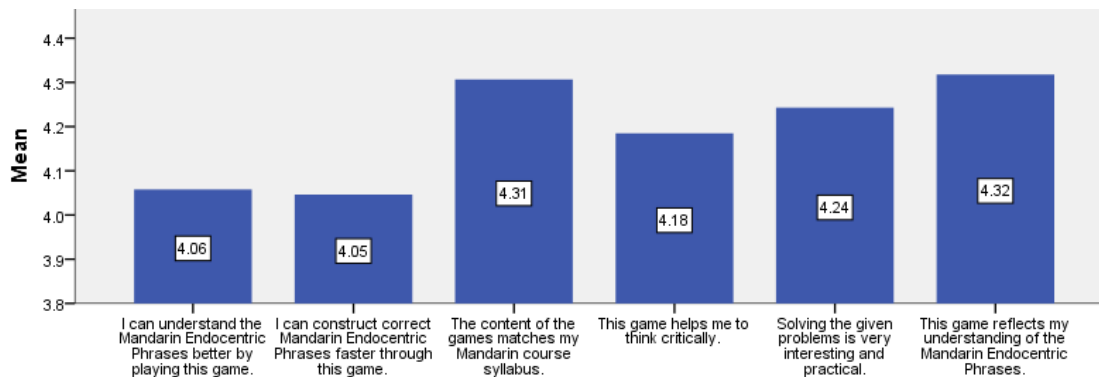


Figure-4. Mean for students' engagement (constructivist learning & cognitive development)

Figure 4 reports how does MEPCP influences students' engagement in learning MEP from the perspective of constructivist learning and cognitive development. The highest score is 4.32 which reflects students' understanding of MEP. Students also found the MEPCP "matches their Mandarin course syllabus" (4.31), "solving problem" (4.24), enable them to "think critically" (4.18), therefore they "can understand MEP" (4.06) and "construct correct MEP" (4.05).

(ii) Learner-centred learning

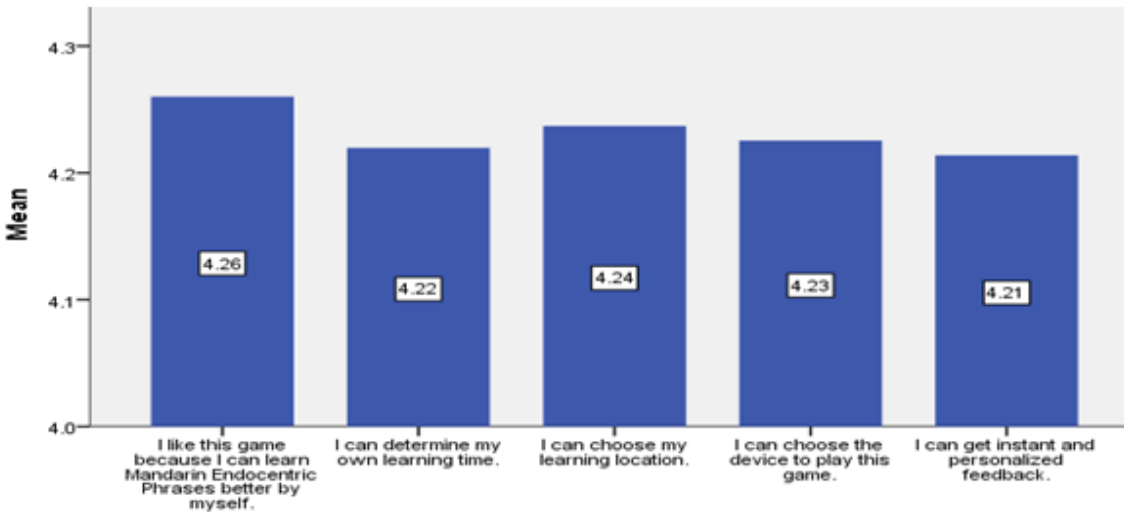


Figure-5. Mean for students' engagement (learner-centred learning)

Figure 5 shows the mean score for the students' engagement from learner-centred perspective. The highest mean is 4.26 indicates the autonomy of students to learn MEP better through MEPCP. It is followed by students can "choose learning location" (4.24), "choose device" (4.23), "determine learning time" (4.22) and "get instant and personalized feedback" (4.21).

Students' performance in playing MEPCP

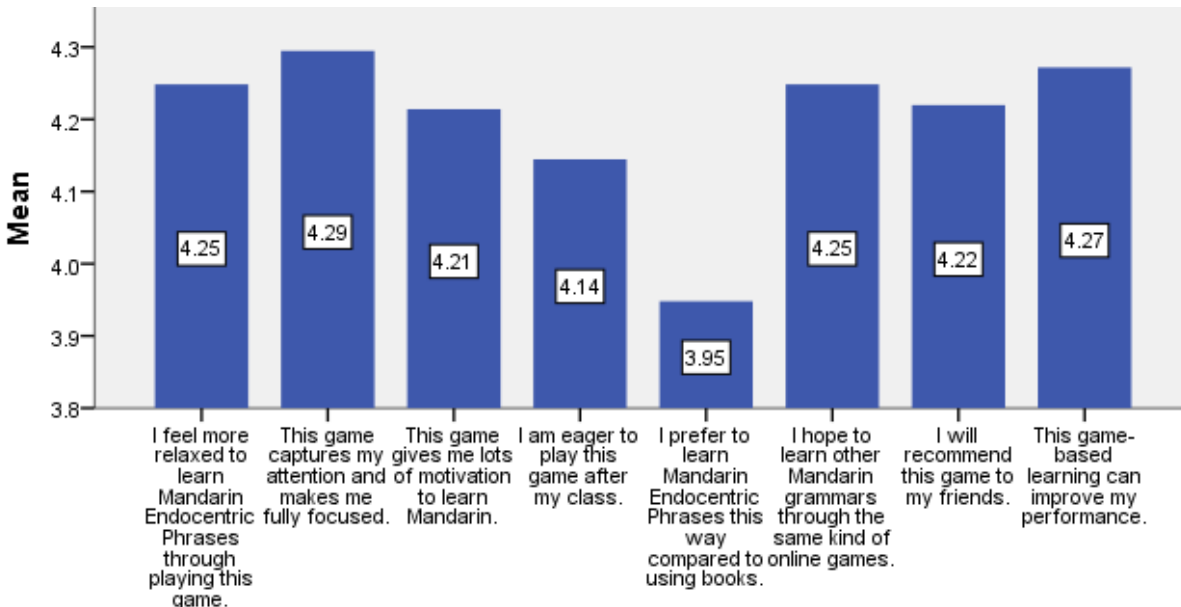


Figure-6. Mean for students' performance

Figure 6 demonstrates the performance of students through their own self-evaluation while playing the game. The top mean score 4.29 implies MEPCP can “capture attention” of students and make them “fully focused”. The students admit MEPCP can improve their performance (4.27) as they “feel more relaxed to learn MEP through playing this game” (4.25). They “hope to learn other Mandarin grammar items” through online games like MEPCP (4.25). MEPCP gives lots of motivation to students to learn Mandarin (4.21), therefore they like to recommend the game to their peers (4.22), they are eager to play the game after their class (4.14) and even prefer to learn MEP by using MEPCP instead of using books.

DISCUSSION

The results of the study show the effectiveness of MEPCP in the learning of MEP by Malay students. Firstly, students had a positive attitude towards the MEPCP. They enjoyed playing MEPCP because it was easy and fun. MEPCP had game-based learning features to motivate and engage students as mentioned by Papadakis et al. (2020). Secondly, the content of MEPCP was based on the Mandarin syllabus in the university, which increased students' understanding of MEP learning and enabled them to construct correct MEP. Students' engagement in learning MEP was also increased as they could choose their own learning time, location and device. In addition, the timely feedback they received from playing MEPCP enabled them to learn MEP better. Finally, the students' self-evaluation when playing MEPCP revealed that the game gave them great motivation to study MEP online.

In other words, students can learn MEP in a more innovative and effective way by using MEPCP. MEPCP is one of the innovative teaching methods to achieve the Mandarin learning outcome. It can be easily accessed and is user friendly. Also, the learner-centered design framework promotes

fun and can provide immediate feedback to the students. MEPCP is also based on the constructivist paradigm where learners experience the content under authentic circumstances. As mentioned by Vlachopoulos and Makri (2017), innovative teaching methods including games can be used to achieve the aim of higher education institutions to prepare the future professionals. The implementation of MEPCP improves the students' Mandarin communication skills, thus nurtures holistic individuals who can realize the aspirations of the Malaysian education system.

CONCLUSION

Undoubtedly, MEPCP provides the students a good Mandarin learning platform as it is accessible and practical. The interesting and interactive characteristics of MEPCP also enable the teachers to deliver their content effectively. In the long term, the MEPCP can be commercialized as a mobile application to benefit both educators and the institution. Future research should explore the experiences of learners as well experiences of instructors teaching MEP using this game-based learning method. Interviews can be conducted to gain deeper insights into their teaching and learning experiences.

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Conflict of Interest

The authors affirmed that there is no conflict of interest in this article.

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Authors' Contributions

All the authors contributed equally in conducting the research and writing the article.

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