AUTHOR NAME(S):   ASST. PROF. DR. ROZINA ABDUL GHANI

ASSOC. PROF. DR. ISMAIL AHAMAD SHAH

ASST. PROF. DR. MASKANAH MOHAMMAD LOTFIE

DEPARTMENT/KULLIYYAH/INSTITUTE/CENTRE: DELL, KIRKHS

ABSTRACT

The study investigates the efficacy of Theory of Variation (Marton & Booth, 1997) in the design of 'Throw Back Time' (TBT), a digital game aimed at teaching grammar tenses and aspects via Mobile Assisted Language Learning (MALL). The study employed a quantitative pretest-posttest single group design to determine whether the game could improve the learners' understanding and knowledge of grammar tenses and aspects; it also employed a survey questionnaire to gauge the learners' perceptions towards MALL in learning grammar. The game is specially designed according to the Theory of Variation. It emphasizes that students understand, experience and think differently in a specific aspect of the world, hence variations in the learning outcome are necessary. The game provides a variety of combinations and structures of grammatical aspects to expose students to different aspects from the object of learning. It ultimately investigates if the game could create a stimulating and non-threatening setting that would help teachers and eventually help learners acquire and improve their knowledge of English grammar.

Keywords: Grammar, mobile-assisted language learning, theory of variation,

INTRODUCTION

One of the objectives of the Malaysia Education Blueprint (2015-2025) is to reinforce and incorporate the use of information and communication technology (ICT) into the process of language teaching and learning in order to enhance students' achievement. This is pressing as the current demand of the global workforce requires university graduates to be proficient in the English Language as it is the prime business language (Abdullah & Shah, 2015; Ganapathy, 2014). Language proficiency entails mastering grammar rules, a crucial component in being skilled users of the language (Abdullah & Shah, 2015, Chomsky & Halle, 1991; Fromkin & Rodman, 1993; Harmer, 1991; Larsen-Freeman, 1991; Larsen-

Freeman, 2015; Mystkowska-Wiertelak & Pawlak, 2012; Shima & Rahmah, 2013; Suwantarathip & Orawiwatnakul, 2015; Ur, 1996).

One technological tool that could play a vital role in students' language development is the mobile phone (Ni & Yu, 2015). It is very handy, relatively cheap and its mobility enables learning beyond the confines of the classroom. Many engaging educational applications and games could be installed in the mobile phones to enhance the students' language growth, analytical skill, passion, intellectualism and creativity (Ni & Yu, 2015); these language activities could also help eliminate learning anxiety in students (Ma, Hwang, Chen & Ding, 2012; Ongoro & Mwangoka, 2014; Shima & Rahmah, 2012; Virvou & Papadimitriou, 2014; Wu, Chen & Huang, 2014). The right approach in eliminating fear and anxiety in students will prove beneficial for students in many ways as the excitement of participating in playing games will invariably promote both conscious and unconscious support for students to learn and acquire the language.

STATEMENT OF PROBLEM

Learners' apprehension towards learning grammar has been found to be among the contributory reasons for the poor mastery of English grammar (Samad & Hussein, 2010; Shima & Rahmah, 2012; Larsen-Freeman, 2015). To alleviate this fear and to activate interest in learning grammar, there is a need to integrate technology which is the trend in education. Many studies have shown the effectiveness of computer-based and network-based teaching and learning of language (Warschauer & Healey, 1998; Hussain et al., 2010; Macia, 2012; Dudeney & Hockly, 2012; Stroia, 2012, Hartman, 2014). But, a more relevant issue at hand is to make technology more accessible so that teaching and learning could extend beyond the four walls of the classroom. One such technological device, both handy and relatively cheap, is the mobile phone. Mobile devices can serve as a teaching tool and are the most influential means of communication surpassing email or chat despite its mechanical restrictions (Miangah & Nezarat, 2012; Jin, 2015).

Promising as it may, educators do realize that technology in itself will not initiate learning if learners are left on their own to select the best applications that could optimize learning. With the enormous commercialized language learning applications, the task of choosing one can definitely be daunting. One of the ways to ease the task of choosing is to be innovative and to create our own applications that fit the needs of learners. The mobile application developed for the purpose of this study is a digital game named "Throw-Back-Time" (TBT). Its design is governed by the principles of Variation Theory emphasizing variation to the activities and options in the activities due to learners' diverse background knowledge. Hence, the study is an attempt at gauging the extent to which the mobile game contributes to learners' knowledge of grammar.

RESEARCH QUESTIONS

The study seeks to find answers to three research questions:

1. How does the theory of variation govern the design of the questions in the game Throw back Time via MALL?

2. Do aspects of variation theory represented in Throw Back Time improve students' knowledge of grammar?

3. What are the learners' perceptions towards learning grammar using the game?

THEORETICAL FRAMEWORK

The Theory of Variation

This theory provides the researcher with vigilant guidelines in the preparation of teaching approaches, which begins with the studying of the students' understanding of what is to be learned. The areas covered for instance, are the proper use of English tenses and methods to improve students' use of tenses. Students are seen to have problems in distinguishing tenses as verb stems in Malay remain unmodified in showing time phrases whereas English verb stems utilize different time phrases to indicate different events.

The theory of Variation by Marton & Booth (1997) propagates that students comprehend, experience and think differently in a specific aspect of the world due to their background knowledge and existing understanding. Students will have different ideas and expectations of what the educators are to deliver, and therefore variations in learning outcomes are necessary. To improve teaching, educators are to bear in mind that whatever they deliver will be discerned differently by different students. Therefore, educators should plan their teaching approaches in the intended way, Marton & Tsui (2004). An object of learning is a specific insight, skill, or capability that the students are expected to develop during a lesson or during a limited sequence of lessons" (Marton & Pang, 2006, p. 194). The concept asserts that, all intellectual actions are targeted on an object. Learning is often about acquiring some knowledge and we cannot deviate from considering what is to be taught. Variation should be used as a guideline so that the "object of learning" is exposed in an intended way. Students should be given a chance to concentrate on the critical elements independently or cooperatively (Bowden & Marton, 1998) using variation models. Essential aspects that have yet to be discerned by students are known as critical aspects (Marton, 2015) which are connected to the object of learning and the students who are involved (Marton, 2015). It is vital to search for these critical aspects for teaching purposes. Thus, the critical aspects in this study are understanding the uses and functions of grammar tenses and aspect.

Normally, we assume that a student can understand the meaning of a word by looking at several examples of what the word refers to. For instance, if we want to introduce a new vocabulary to the students, such as "what is cat" we will illustrate with

several examples of what a cat refers to. This is done by directing the students to the first, second and third cats and say cat, assuming the students know the meaning of cat as an example of an animal. The students cannot discern that a cat is an example of animal if there is only one animal, without getting to know other animals besides the cat. They should know how a cat deviates from other animals. What the educators varies and keep in the classrooms will affect what the students will learn (Bowden & Marton, 1998; Marton, 2015). The theory does not highlight teaching methodology but reinforces the necessary aspects when students are taught new things. The core of the theory lies on discernment which is vital in learning (Marton, 2015).

Several studies by Marton & Morris, (2002), Marton & Tsui (2004) and Annie (2011) believe that educators who use the theory of variation are likely to be successful with the results of learning as compared to those who go without the use of the theory. There are four aspects of variation namely contrast, separation, generalization and fusion Marton & Runesson (2003). There are many studies in language learning and grammar that have successfully benefited from the theory of variation for example in teaching reading (Tong, 2012), writing (Thorsten, 2015), present tense (Annie, 2011), present perfect (Annie, 2011; Roy, 2014) and adverb (Roy, 2014). This particular study seeks to investigate the extent Variation Theory help in designing the digital board game 'Throwback Time' (TBT) in teaching grammar tenses and aspect.

The digital board game in this study was designed in a manner that permits students to recognize and learn tenses through variation. In designing the contents of the digital board game, the researcher has exposed students with, or to, the crucial patterns by using sentences in a manner that characters, actions and events in the sentences remain unchanged, but the linguistic and discourse aspects of the sentences are varied. The idea is to see if students can discern the underlying principle or grammar rule and whether they can discern what is important and what is not important in making decisions about the correct use of tenses.

METHODOLOGY

The study employed both quantitative and qualitative research design.

Qualitative:

A content analysis was employed to elucidate the extent the theory of variation (TOV) helps in designing the digital board game 'Throwback Time' (TBT) in teaching grammar tenses and aspect. The researcher presented a specification from the Theory of Variation that governed Throw Back Time digital game. Each type of the questions in the game is described based on the specifications from the theory which are based on the elements of contrast, separation, generalization and fusion.

Quantitative:

A quantitative study by means of a time series pre-test/post-tests single group design and a survey questionnaire.

Research Instruments.

1) The first instrument is the digital board game Throwback Time (TBT). The questions in the game was design based on the theory of variation (TOV). The digital game consists 664 grammar questions which were taken from UiTM textbooks namely Focus on Grammar Workbook 1 by Seaton & Kirkpatrick (2009), Fundamentals of English Grammar, Fourth Edition by Azar & Hagen (2011), Focus on Grammar 3 by Fuchs et al. (2012), and Fun with Grammar by Woodward (1997). The grammar questions were edited by Prof Mun Ling Lo, from Hong Kong University, an experienced Professor in the field of English grammar and English language acquisition and an expert in The Theory of Variation (you need to change this…She is an expert in the theory but not in the field of ESL). The content development of the game had gone through thorough, rigorous and appropriate assessment evaluation in the preliminary work of the research. Each type of question was checked, commented and amended by Prof Mun Ling Lo to ensure that it complies with the specifications of the theory that include contrast, separation, generalization and fusion. Besides, two experts in computer science and mobile learning were also assigned to examine the design of the digital board game. Their comments and suggestions were considered in further improving the design of the game. The feedback from the expert of The Theory of Variation, Computer Science and the lecturers of grammar is important to ensure that the game content is in line with the principles of the theory, game design, learning approaches and language acquisition standard.

2) The second research instrument was the pre- and post-test consisting of 50 error identification and correction sentences. The students have to identify 1 error from each of the 50 sentences concerning tenses and aspects (present, present progressive, past and past progressive tenses) by underlining and correcting the errors and writing the correct words on top of the words that they have underlined. The pre-test and post-test questions were formulated based on the content of the recommended textbooks chosen by UiTM, a local Malaysian University. The Cronbach's alpha reliability test result for the pretest and posttest questions is (.855) which is considered acceptable.

3) The third instrument was a survey questionnaire used to delve into the students' motivation and perceptions towards learning grammar via MALL. It also investigated the students' perception of MALL's perceived usefulness and perceived ease of use (Ducey, 2013).

   It consists of two sections. Sections A is to elicit gender and include close-ended questions to examine learners' attitude and reflections towards grammar learning.

Section B, on the other hand, involves the Likert scale questions that examine learners' perceptions on the use of the digital board game Throwback Time (TBT) via Mobile Assisted Language Learning (MALL). A 5-point-Likert Scale is used to focus on Technology Acceptance Model (TAM) elements employed from Ducey (2013) that include:

1. Perceived Usefulness (PU) – to examine whether TBT via MALL is beneficial to learn grammar.

2. Perceived Ease of Use (PEOU) – to see whether TBT via MALL is easy to use.

3. Attitude (A) – to check whether TBT via MALL is accepted by learners.

4. Behavior to use (BI) - to examine whether learners would continue using digital games via MALL in future.

Sampling

A purposive sample population of students from the Teaching English as a Second Language (TESL) foundation program of Universiti Teknologi MARA (UiTM) Dengkil Campus. The students are trained on the four important language skills of reading, writing, listening, speaking and Grammar. They possess a minimum distinction of A- grade in Sijil Pelajaran Malaysia (SPM) English. There were 48 subjects in the group at the beginning of the experiment and 47 in the middle of the experiment as one participant withdrew due to an illness.

Procedure

The data collection process took approximately ten weeks to complete from 29 June until 7 September 2016. Even though one semester consists of 14 weeks, the first two weeks were allocated for registration and orientation. The remaining two weeks at the end of the semester was for students to complete their quizzes and tests and it was also the study week before the final exams. The researcher only had 10 weeks with the students to complete the experiment.

Subject Content:

As future tense is not included in the syllabus, the study dealt only with grammar tenses (Present Tense, Past Tense) and grammar aspects (Present Progressive, Past Progressive).

The 47 participants were randomly grouped into 23 pairs with one participant having to work alone. Each pair was given a seven-inch tab on a loan basis to be used for ten consecutive weeks. A seven-inch tab was used so that learners could have bigger screens for better viewing. The size is considered handy and of about the ideal size for the respondents to use and play the digital game while learning grammar. Besides, bigger screens can facilitate the learners' task in answering the different types of questions as well as in enjoying a clearer version of the game and the interactive visual images in the game. The students were free to use the tabs at any time or venue every day as long as it took

place during their free time. Before the tabs were distributed to the students, each of them had to sign "a facility -use agreement form" to ensure that the tabs would be kept secure at all times. Prior to the experiment, the students were briefed on how to handle the game, to adhere to certain procedures throughout the experiment & to identify the importance and the relevance of the interactive digital board game "throwback time" (TBT) with "Grammar 1" (TSL 041) subject that the students had to study for that particular semester. In fact, the contents of the board game that consist of grammar tenses and aspect questions are geared to the curriculum of that particular semester (Grammar 1). (Politi, 2017; Bikowski, 2018) highlight that each educational application needs to relate to the curriculum objectives and has to be based on innovative activities through intelligent and interactive technologies. Hence, Learners will get more exposure on the learning input in an amusing way. Throughout the experiment, the students referred to the researcher if they had any problems with the digital game or if they wanted clarification on grammar tenses and aspect.

The researcher met the students once a week for a two-hour face-to-face monitoring and supervision. Apart from the researcher, two assistant lecturers were assigned to ensure the students played the digital game every day and to monitor the students' progress throughout the experiment. To facilitate the experiment, a WhatsApp group was created for daily updates between the researcher and the participants. MALL application should include communication among the participants which can be done via blogs, forums or groups (Soad & Barbosa, 2016). The WhatsApp group acted as a medium to share any problems encountered with the game. It is also used to monitor the participants' feedback on the digital board game. Furthermore, for monitoring purpose, the students were given one log book each to update their progress every time they play the game by listing the details on:

1) The time they start playing the game
2) The date
3) The duration of time that they choose (either 5, 10. 15 or 20 minutes)
4) The number of players involved in the game (either 1. 2. 3 or 4 participants)
5) The scores they obtain
6) The number of correct and incorrect answers they make
7) Time out (how often do they go beyond the time limit in answering each quiz)
8) The time taken (how long do they take to answer all of the quizzes in one session?). The researcher checked the log books manually every week and made comments or offered advice to make sure that the students would reap the optimum benefits from the digital board game.

RESULTS AND DISCUSSION

RQ 1. How does the theory of variation govern the design of the questions in the game Throwback Time via MALL?

- According to the theory of variation (Marton & Booth, 1997), the object of learning is the central issue in learning. The problem is students having years of exposure and experience learning grammar tenses are still unable to use grammar tenses accurately and proficiently. **Therefore, the proper use of tenses and aspect is the object of learning in this study.**

- The research then looked into how the object of learning is positioned in the whole conceptual framework of English language and the appropriate style to be used to assist the student to discern the input.

- Next, the researcher identified the critical aspects of the object of learning by looking at students' prior knowledge and worked on the variation patterns to be used by the students. Investigating students' prior knowledge of the object of learning is crucial is order to see the how different it is from the teacher's point of view (Lo, 2012).

- Based on the analysis done on the final grammar test that the students took in their first semester and interviews with several students from different proficiency levels, **the researcher found three crucial problems with the use of grammar tenses which are verb form, time reference and understanding the context.**

- In designing the contents of the digital board game, the researcher exposed the students with the crucial patterns by using sentences in a manner that characters, actions and events in the sentences remain unchanged but the linguistic and discourse aspects of the sentences are varied.

- Since there are four tenses and aspect involved in that particular semester, the researcher had to consider them as an object of learning where some critical aspects are related to each of the tenses. For example, what makes learning simple present, simple past, present progressive and past progressive difficult for students to digest?   Some of the critical features included a) when to use the tenses and aspects, b) how to use them, c) what is the subject verb agreement and d) plural versus singular of each tense. After considering the critical features then only the researcher prepared the questions for the digital board game as to treat the object of learning.

- The theory of variation propagates that if there are many critical features involved, each has to be treated individually first and then only followed by the simultaneous use of all aspects (Lo, 2012).

- Each of the critical aspects (tenses and aspect) need to be treated separately first to help students discern them. Thus, the researcher created a 'practice' section consisting of notes, tables and quizzes on each grammar tense and aspect.

Figure I: Practice session

- The theory of variation propagates that if there are many critical features involved, each has to be treated individually first and then only followed by the simultaneous use of all aspects (Lo, 2012). Each of the critical aspects (tenses and aspect) need to be treated separately first to help students discern them. The 'practice' button consists of notes, tables and quizzes on each grammar tense and aspect.
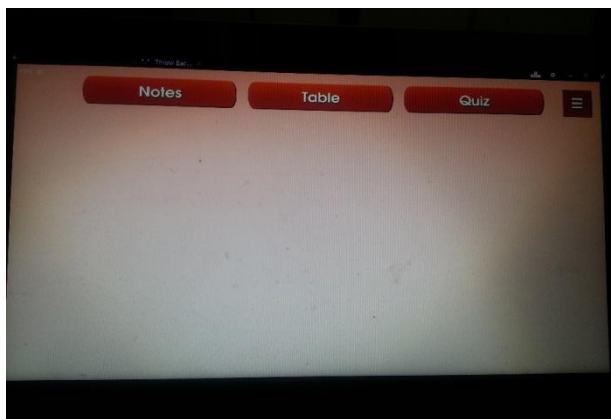

Figure 2: Practice: click on notes, table or quiz

- The notes are in a form of formula. It is used as a part Language learning strategy to assists learners to cultivate language competence as it permits learners to incarnate the learning development (Embi & Amin, 2010). The formula would help the students to remember the uses and functions of each tense easily. It is stated in brackets in each tense and aspect as below:
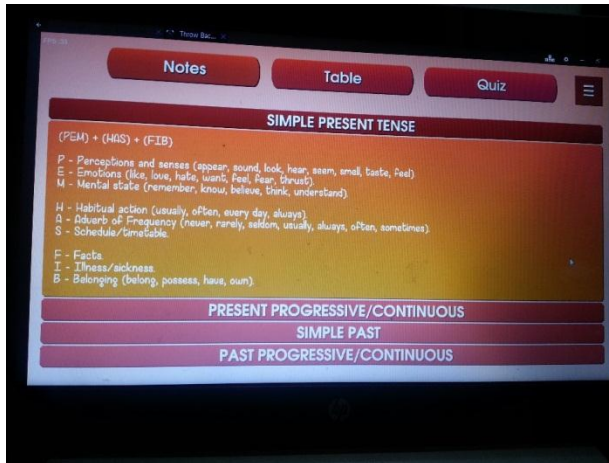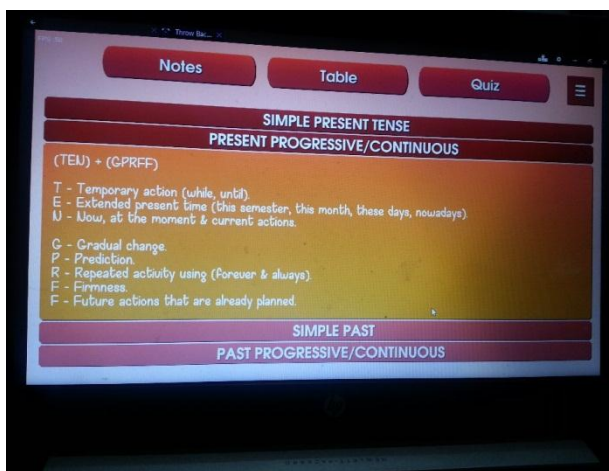
Figure 3: Simple Present
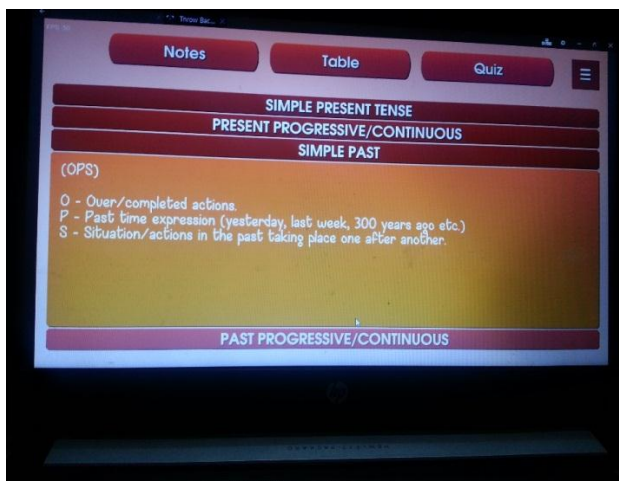

Figure 4: Present Progressive
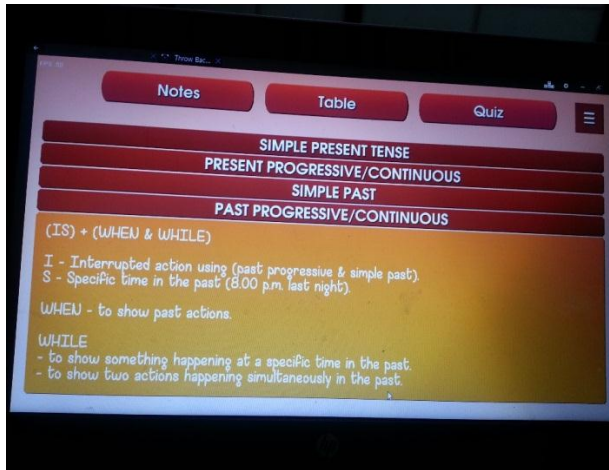

Figure 5: Simple Past

Figure 6: Past Progressive

- Besides the formula, the students are also provided with tables that consist of the subject, verb and object of each tense and aspect. The aim is for the students to understand each tense and aspect before moving to the next level. The examples are as follow:
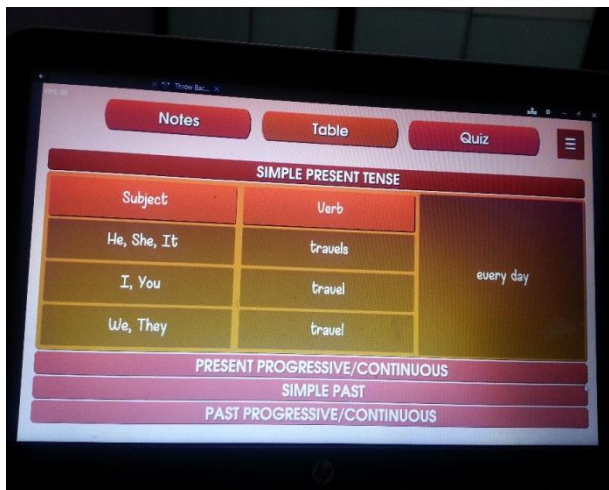

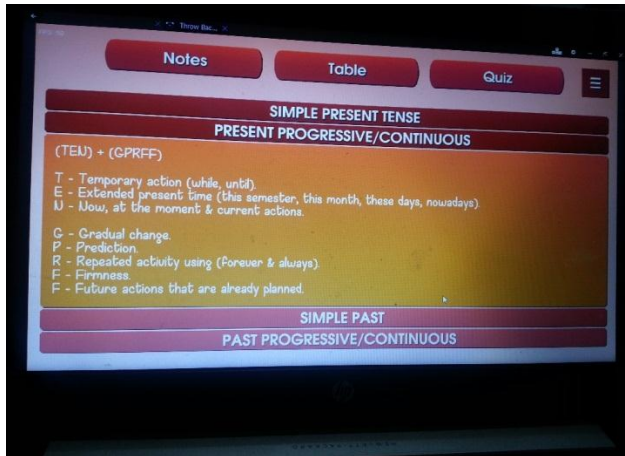Figure 7: Simple Present

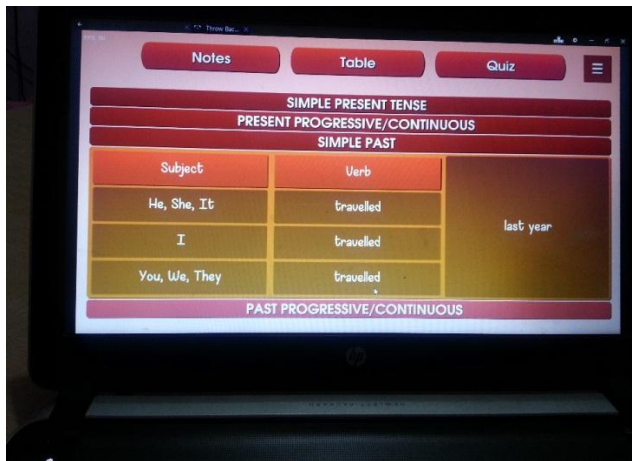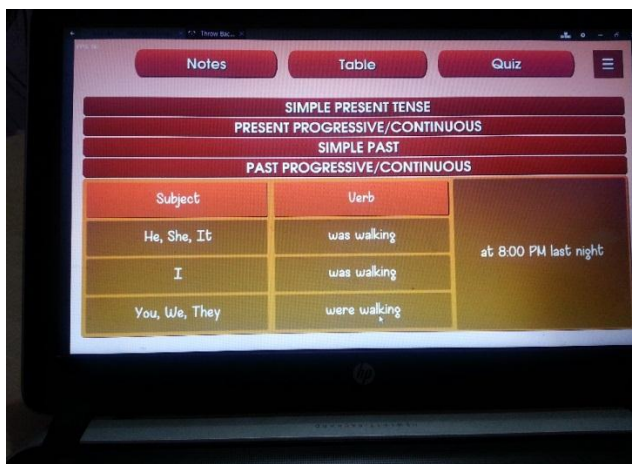Figure 8: Present Progressive

Figure 9: Simple Past

Figure 10: Past Progressive

- Apart from the formula and table, there are quizzes that would assist them on the simple and basic exercises of each tense and aspect.

- There are 79 questions in the quizzes altogether and each quiz or exercise is accompanied by hints or explanations that explain what the answers to the quizzes should be and why. The examples are:
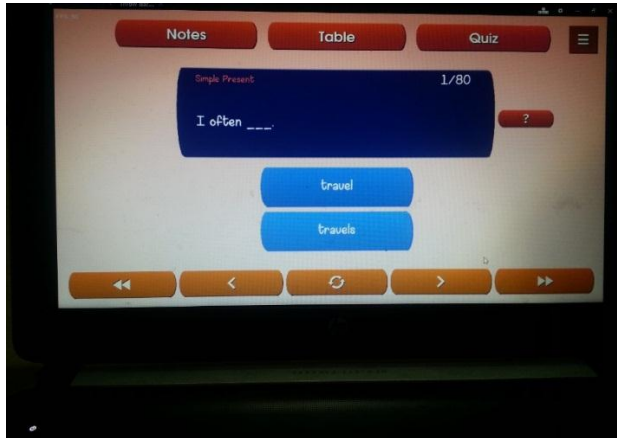

Figure 11: Practice exercise

- The "?" button on the right hand side consists of hints and explanations to each sentence. It can be clicked to see the explanation of the answers.
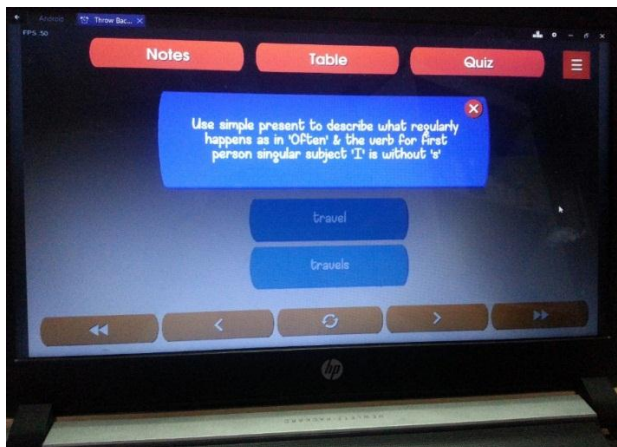
Figure 12: Explanation of the answer

- The players can go through the formula, table and answer the quizzes as often as they like to get used to the critical aspects. Since the game is designed to teach grammar tenses and aspect, it is arranged so that the critical features are treated separately first so that each is discerned before allowing them to vary together.

- Once the players are confident and have equipped themselves with the basic rules of the tenses and aspect, then only they can start playing the digital board game by clicking the "board game" button.

- There are 664 set of questions in the digital board game based on six types of questions that include:

    a) Two options of answers,
    b) Three options of answers,
    c) Four options of answers,

13

d) What is the similar sentences with the given one?

e) What is the rule of the sentences?

f) Fix the sentences using correct grammar rules.

The first three types of questions are described below:

a) Two options of answers:

Choose the correct answer from two options of answers given. The options are either based on simple present with present progressive or simple past with past progressive.

b) Three options of answers:

Choose the correct answer with three options of answers given. The options are based on simple present, present progressive and simple past.

c) Four options of answers:

Choose the correct answer with four options of answers given. The options are based on simple present, present progressive, simple past and past progressive.

- **The rationale of using (two, three and four options of answers)**

The application of the theory of variation

First the attempt is to fuse the critical features two at a time (varying two critical features at the same time). Learners need to compare the simple present with present progressive or simple past with past progressive in order to differentiate the two tenses and understand them more clearly. Here the contrast aspect from the theory of variation is applied where students would be able to contrast the correct and incorrect use of different critical features like tenses, singular or plural etc. Contrast will rise students' alertness of the differences from the critical features. Then to fuse the critical features three at a time (three options of answers) and finally all (four options of answers) of them together. Fusion is then applied when all the critical features are used simultaneously. At this stage, students have to consider when and how to use each grammar tense correctly and compare and contrast more than one critical feature simultaneously. Here the idea is to try to vary what is critical for students to discern while keeping all others constant. The game is also graded in difficulties, so that students would have to master questions with two answers before going to questions with three answers and finally with four answers.

- **The Pattern:** Similar sentences but in two, three and four different tenses. The students have to choose the correct tense by checking the timeline.

- **Critical Feature**:

- To recognize and understand how time markers, time referencing and the context indicate the series of events, and the concept of the relationship of the action to the present.

14

- To recognize the correct tense as to show the series of events in the context.
- **Invariant**: The object, actions and events are similar
- **Variant**: Tense aspects of the action, verb and meaning
- In the pattern, the students will see two, three and four sentences with the invariant and variant aspects. The sentences are based on the contrast element of variation to assist the students to choose the correct tense that shows the appropriate time reference and context, series of events and the connections of the action to the present.

- The sentences are based on two levels. The first level demands the students to analyze the separate semantic level by looking at the time markers. The second level on the other hand, demands the students to analyze the discourse level to find the contextual clues to determine the use of tenses because the sentences might be right in specific context. The students will also apply fusion pattern of variation when they think about the present simple, simple past, present continuous and present continuous and past continuous tense concurrently in similar context. This will be tricky as they were exposed to the four different tenses individually earlier in the 'practice' session. The sentences also appear in time line order in order to show the students of different events for instance (in 1957, currently, this semester, every day). The critical features of time line can serve as clues that lead to the correct sentence. In this game, the students would distinguish the connection between the tenses used and their meaning in the context through generalization variation pattern. They have to analyze each sentence by looking at the clues available to get to the correct sentence. Besides, they have to differentiate and understand the different tenses and meaning from the two, three and four options given. In other words, the students will be able to utilize the contrast and fusion patterns to assist them to understand the critical features of the object of learning. Besides, the students will be able to come out with proper approach in analyzing the time markers and events and their connections that will lead them to the correct tenses. In other words, learners are exposed to how grammar tenses and expect express singular and plural and the how verbs are formulated to express time. By exposing grammar conceptually, learners are aware that language is not arbitrary and unplanned. Language consists of proper structure and without appropriate structure, it has little meaning. Learners are able to discern how grammar works through the examples of usage and not from knowing rules (Azar, 2007). It is the teachers' role to define how the structures work. Easy drills on form and meaning are important to enhance learners' cognitive alertness on the structures formation.

The other three types of questions in the digital board game are:
d) What is the similar sentences with the given one?

The rationale of using (What is the similar sentences with the given one?)

The application of the theory of variation

Learners first confronting sentences of the same category might perceive them as an unseparated whole, i.e. sentences of the same category are merged and cannot be foreseen independently. To assist learners to separate sentences from the same category, they must be exposed to different roles that each sentence carry. An apprehension of 'sentences' and 'same category' will allow the dimension of variation (roles) takes place with 'sentences' and 'same category' as values. Later on when the learners confront other roles, these roles will act as values on the dimension of variation. The value from the dimension of variation (sentences and category) is the subsidiary to the dimension of variation (roles). In another word, we cannot discern how others discern an object without knowing how different it is with other object, or in what capacity of variation it stands.

The pattern: To choose one best sentence that has a similar grammar rule with the sentence provided.

Critical Feature:

a) In this way, the pattern of variation would allow players to separate (by comparing the non-examples) and generalize (by comparing the examples).

b) The idea is to give sentences that are in the same category, so that students can make generalization, and contrast this with a group of sentences that are not in this group (that is, using the grammar rule), so that students can separate off those rules that do not apply.

Invariant: Here the grammar rule is kept constant.

Variant: The sentences vary.

e) What is the rule of the pair?

The rationale of using (What is the grammar rule of the sentences?)

The application of the theory of variation

Here when learner is able to see the different grammar rules of the same category (Present Progressive) by contrasting the rules with one another, we can assume that the category is separated from the rules, and an element of variation is extended (i.e. future arrangement, repetitive action, happening now, and temporary action). Learner might perceive the same category as an undivided whole earlier, but after realizing the value (feature) and its dimension of variation (aspect), is able to see the value separately, switching it or even labelling it. The category is clearer by extending the dimension of variation that is a value. Here the value is separated from the rules of which is the feature.

The pattern: Different sentences from the same category (Present Progressive)

Here players need to choose one best grammar rule from the same category that fits the two sentences.

Critical Feature:

a) To recognize and discern the functions of different grammar rules from the same category

b) To recognize the correct rules as to show the series of events in the context

Invariant: The category (grammar tense/aspect) is similar

Variant: Here the variation takes place in the grammar rule, one is correct and the rest are incorrect. Since each tense and aspect has different functions, the aim is to get the players to understand each function of grammar rules from the same category better. As we are aware of each tense and aspect serves different roles and functions. For instance, present progressive can serve to show temporary action with (while, until), extended present time with (this semester, this month, these days, nowadays), current action with (at the moment, now), repetitive action and to show firm stand. In other words, different sentence from the same category serves different purpose.

f) Fix the sentences using the correct grammar rule?

The rationale of using (Fix the sentences using the correct grammar rule?)

The application of the theory of variation

The Pattern: Grammatically incorrect sentences.

Players have to fix them by choosing the best grammar rules to fix the sentences.

Critical Feature:

a) The idea is to see if students can discern the underlying principle or grammar rule and

b) To see whether they can discern what are important and what are not important in making decisions about the correct use of tenses.

Invariant: The object, actions and events are similar

Variant: Tense aspects of the action, verb and meaning

To ensure that learners digest what they learn and to boost their analytical and problem-solving skill, we need to present them the correct and incorrect elements (Lo, 2012). Learners should not be presented with the correct version all the time. By doing this the pattern of variation involved will be separation and generalization in the use of grammar rules.

The six types of questions designed in the game covers all the elements from the theory of variation which are contrast, separation, fusion and generalization. By including the elements together, players will see the connection among simple present, present continuous, simple past and past continuous and not as separate entities. Similarities are difficult to discern without seeing the difference (Lo, 2012). Students need to see the differences among the tenses and aspect in order to understand each tense and aspect better

by comparing and contrasting them. Furthermore, the exercises of questions are designed in six different ways considering that students perceive different elements differently. Individuals will be good on something by seeing the experience of the same learning element (Ur, 1996; Lo, 2012; Al-issa, 2014). In other words, what teachers wish to present in the object of learning might be accepted differently by the learners. The questions which are designed in different contexts are meant to develop consciousness and apprehension elements through a wide range of variation (Marton & Booth, 1997; Lo, 2012). In other words, several patterns of variation and invariance is needed to acquire the object of learning. Besides, the questions are presented one at a time (two options of answers, followed by three options of answers, four options of answers, what is the similar sentences with the given one? what is the rule of the sentences? and fix the sentences using correct grammar rules). The rationale is learners cannot digested all the elements simultaneously (Miller & Nicely, 1956). Our ability to focus on different kinds of elements altogether is limited. Furthermore, "Students may have qualitatively different ways of experiencing the same situation, so this generates different experiences of the same object of learning for each student" (Lo, 2012, p. 29). Learners perceive the same element differently, which results to different of grammar structures in terms of form, meaning and correct usage of structures. Exercises based on repetition and in different contexts put the learners at ease in practising the target language and help to expand the progress of their interlanguage (Azar, 2007). Studies claimed that the teaching and learning grammar should involve how it works through different grammatical concepts (Azar, 2007; Jean & Simard, 2011; Baugher, 2012; Brown, 2014; Diane Larsen-Freeman, 2015). Apprehension on how structures work assists the learners to express what they mean and leads to better communication and writing proficiency, the basis of second-language acquisition.

RQ 2.   Do aspects of variation theory represented in Throw Back Time improve students' knowledge of grammar?

- There is a significant different from a) pre-test and post-test 1, b) post-test 1 and post-test 2, c) post-test 2 and post-test 3 as the 'p' value of each post-test is more than 0.05 but d) there is no significant different from post-test 3 and post-test 4 as the 'p' value is (.55903) which is not strong.
- Nevertheless, there is an increment in trend analysis in the bar graph in Table 3 from pre-test towards post-test 1, 2, 3, and 4.
- The improvement in the post-test scores of the respondents shows that the use of TBT via MALL in teaching grammar permits students to retain grammar rules and reduce grammatical mistake. This is in line with the studies done by Baleghizadeh and Oladrostam (2010), Li (2013), and Jin (2015) that found positive benefits of using MALL in teaching grammar.

- These positive findings could initially allow us to deduce that the more people play the games, the more positive emotion will be developed (Schwarz & Braff, 2012).
- It is also possible that the non-threatening environment of gaming put the students at ease with their lessons and helped them to acquire better input and hence perform better in the post-test.

TABLE 1

Students' Pre and Post-Test Scores

Paired Samples Test

| | | Paired Differences | | | | | | | Sig. (2-tailed) |
| | | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | | t | df | |
					Lower	Upper			
Pair 1	PRETEST - POSTTEST 1	-5.8936	5.0054	.7301	-7.3632	-4.4240	-8.072	46	.000
Pair 2	POSTTEST 1 - POSTTEST 2	-1.5106	3.9002	.5689	-2.6558	-.3655	-2.655	46	.011
Pair 3	POSTTEST 2 - POSTTEST 3	-4.5957	5.2239	.7620	-6.1296	-3.0619	-6.031	46	.000
Pair 4	POSTTEST 3 - POSTTEST 4	-1.08511	3.83253	.55903	-2.21038	.04017	-1.941	46	.058

TABLE 2 Trend Analysis
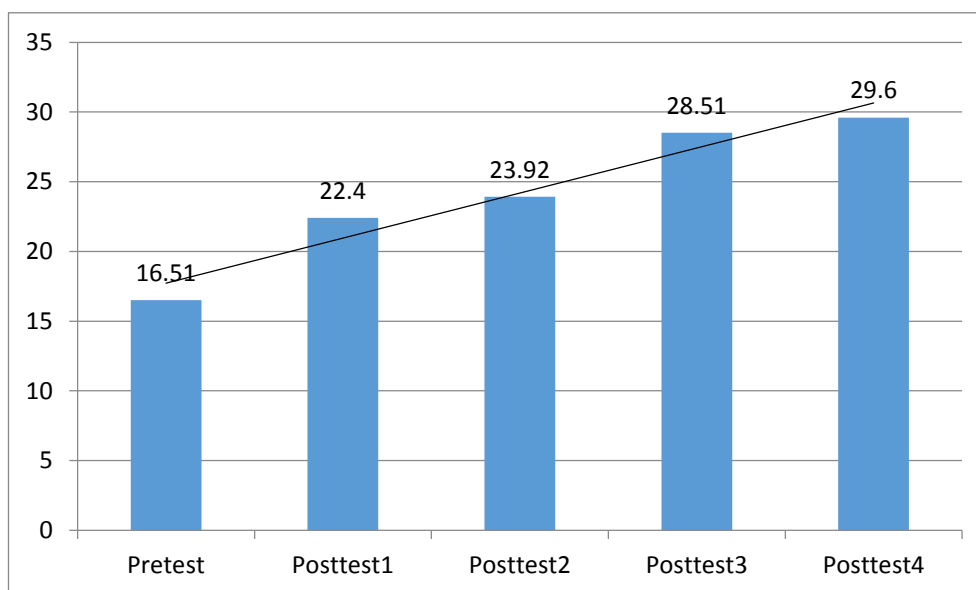
RQ 3. **What are the learners' perceptions towards learning grammar using the game?**

- The findings show that 97.8 % of the respondents strongly agree and agree that TBT via MALL is an interesting method in learning grammar.
- The other 2.1 % remain neutral to the statement.
- 95.7% strongly agree and agree that TBT via MALL is a useful method in learning grammar and the remaining 4.3 % agree to the statement.
- 100% strongly agree and agree that TBT via MALL can help to improve grammar knowledge.
- 85.1% of the respondents strongly agree and agree that TBT via MALL can help them to remember grammar rules, and 14.9 % remain neutral.
- 95.8. % of the respondents strongly agree and agree that Throwback Time (digital game) via MALL is a good idea to learn grammar and only 4.3 % remain neutral to the statement.
- 100% of the respondents strongly agree and agree that Throwback Time (digital game) via MALL is helpful.
- 78.8% of the respondents strongly agree and agree that they are confident to learn grammar using Throwback Time (digital game) via MALL and 21.3% remain neutral.
- 91.5% strongly agree and agree that Throwback Time (digital game) via MALL is easy to use, 6.4% remain neutral.
- 2.1 % strongly disagree to the statement.
- 91.5% of the participants intend to use MALL in various learning activities in the future and the other 8.5% is neutral to the statement.
- 68% strongly agree and agree to use MALL frequently and 31.9 remain neutral.
- Lastly, 59.6% of the respondents intend to be a heavy user of MALL the other remaining 40.4% is neutral to the statement.

The promising findings are encouraging as they reflect a positive attitude towards MALL which, in turn, "lead towards better long-term retention than rote learning" Brown (2001, p.57). The study believes that the integration of digital board game via MALL into the teaching and learning practices is likely to result in more positive impact, inventive and enhanced grammar learning. The results are in accordance with the previous study by (Davis, 1989) that claimed when students notice that an application will make a difference in their grades, they will see the application as beneficial and would want to use it and get benefits from it. The positive attitude represents their optimistic behaviour in utilizing an application via mobile technology.

TABLE 4

Students' Perceptions on the Digital Board Game via MALL

Statements	Strongly Agree (%)	Disagree	Neutral
1. Interesting method in learning grammar	97.8	2.1	
2. A useful method in learning grammar	100		
3. Can help improve grammar knowledge	100		
4. Can help remember grammar rules better	85.1		14.9
5. It is a good idea to learn grammar	95.8		4.3
6. It is helpful	100		
7. I am confident to learn grammar	78.8		21.3
8. It is easy to use	91.5	2.1	6.4
9. Intend to use MALL in other learning activities	91.5		8.5
10. Intend to use MALL frequently	68		31.9
11. Intend to be a heavy user of MALL	59.6		40.4

Results of The Interview
- All of the participants claimed that they were able to compare and contrast the usage of the tenses and aspect with the use of time markers.
- They realized that different usage of tenses and aspect convey different meanings.
- They further reported that "time phrases" did not always work in finding the appropriate answers to the questions. Therefore, other method like checking the contextual clues was also necessary to discern the meaning.
- They managed to generalize the use of textual meaning to further discern the tenses and aspect.
- They also commented on the options of tenses in the answers.
- One group claimed that "having more than one options in the answer part, reminded us what the different verbs are for. The options given actually lead us to the correct answers".
- They agreed that when the tenses are mixed up, they learned different kinds of tenses easily.
- Other than that, they were more alert on the arrangement of "subject verb object". In order to make sure that the subjects of each tense

and aspect agrees with the object, they had to consider the singular and plural items.

- They felt that they did not take the element seriously before being exposed to the game.
- They also welcomed the explanations or reasons initiated in the game. The explanations or reasons helped them to learn the connections among the tenses and aspect in a clearer manner. Four of the groups claimed that "the notes in the explanations are concise and straight forward, we can remember the do's and don'ts of grammar elements'. They believed they learned a lot from the explanations given that helped to enhance their understanding of the critical elements in a better way. Several other groups reported that "we know and remember what we do wrong and will not repeat the same mistakes again'. They were also adamant that the discernment of the critical elements will enhance their understanding of grammar. On the other hand, other groups claimed that "the explanations are very helpful as they come right after making the mistakes, the explanations explain what is right and wrong". They felt that the clarification in the explanation given helped enhancing their grammar as well as their writing and speaking skills. The result is in accordance with the studies by (Malone, T. W., & Lepper, 1987) that claims feedback function permits learners to keep updated on their progress in order to reach the learning objectives and it will enhance learners' interest. By providing feedback, learners will be more at ease as the game is meant to be fun and enjoyable.
- They reported that they were learning in a fun way. One group stated that "as we play, we learn something without realizing it". "We learn to look for clues, we learn the structure of different grammar elements and the specific usage of each tense and aspect".
- The other group added that "The game makes us independent learners. It all depends on us. If we want to be better, we have to play the game every day".
- After all, several students claimed that using the game via MALL provides them with continuous practice to grammar exercise "While other friends of mine are panicking and busy reading grammar notes for test 1, we can just relax, we know we will get a lot of input by just by playing the game".
- They believed that the application involves less effort and they can use it anywhere and anytime that they prefer to prepare for their test.
- Other students also added that "The exercise kind of reminding me of what I do in class, it refreshes my memory of what I have learned".
- The participants were also in favor of the game application. All of the groups agreed that "The game application is good".
- One of the groups reported that "it is very nostalgic, it reminds us of mine craft" and the other group added that "the game surpassed our expectations".

The result is consistent with previous studies that believe that the teaching and learning grammar should involve how it works through different grammatical concepts (Azar, 2007; Jean & Simard, 2011; Baugher, 2012; Brown, 2014; Diane Larsen-Freeman, 2015). Learners will be able to improve their learning performance when

they are able to comprehend how grammar works through different grammatical concepts.

It also concurs with a previous study by (Bazzaza et al., 2016) that reported that the students were contented with the exposure and believed that the learning experience as fun and amusing. They also added that they were unconsciously able to learn something while having fun in the activity. When students notice that an application will make a difference in their grades, they will see the application as beneficial and would want to use it and get benefits from it (Davis, 1989). This will result in optimistic behaviour in utilizing an application via mobile technology. The positive emotion is in line with the researcher's aim to transform the game as an autonomous learning experience where the learners take control of their learning process in an enjoyable way.

Ample practice and repetition on certain elements in game play will enhance character skills (Lo, 2012; Jantke & Hume, 2015). Consequently, the approach exposes student to learning activity constantly even they are not under the supervision of their teachers in the classroom.

• As technology is integrated into the learning surrounding it cannot run away from novelty value (Krendl & Clark, 1994). Learners are likely to be excited to utilize a new approach in their learning activity. However, once the approach is well known to the learners, the novelty aspect will fade away. Therefore, educators and innovators will need to examine certain aspects of how to sustain the novelty value to enhance learners' excitement and inspiration. One way of doing so is to come out with stages of different difficulty levels that will sustain learners' interest in accomplishing their learning activities.

Above all, they acknowledged the experience that they received to see how grammar tenses and aspect work, to discover answers to their uncertainties and to discern the newly structures formation through plenty of drills.

Conclusion:
Output:
1. An article entitled: MALL in developing second language learners' grammar performance, Journal of Academia (JOA) UiTM Negeri Sembilan e-ISSN:2289-6368 (Online).
2. Blogging as a Tool in Developing Writing Skills:
   Lessons from the Experience of the Students and Class Teacher.
   The Asian EFL Journal Professional Teaching Articles December 2016 Special Issue Volume 5
   pp 280-293
   http://www.asian-efl-journal.com
   ISSN 1738-1460
   INDEXED IN SCOPUS
3. Patterns of Negotiation of Meaning Routine in Online Forum PERTANIKA Journal of Social Sciences & Humanities (JSSH) Vol. 25 | No. 3 | Sep 2017 ISSN 0128-7702 (Print)
   2231-8534 (online)

4. A PhD thesis on: Using the digital board game through mobile learning to enhance the learning of grammar: A case study.

Copyright: In order to protect the researchers' original innovation, a copyright protection has been issued on the digital board game under *literary work* category, from the Intellectual Property Corporation Malaysia (My IPO) on 7 September, 2016.

Future Plan of the research: The digital game courseware can be commercialized as a teaching module to be used by ESL teachers and learners specifically in the teaching and learning of grammar.

References

Abdullah., H. I., & Shah, P. M. (2015). Enhancing Competency in English: The Covert Approach a Complementary to the Overt Approach in Teaching Grammar. *International Journal of Applied Linguistics & English Literature*, *4*(1). https://doi.org/10.7575/aiac.ijalel.v.4n.1p.191

Al-issa, A. (2014). Constructing Grammar Instruction in the Omani ELT System : A Critical Literacy Perspective. *The Qualitative Report*, *19*(1989), 1–26.

Annie, T. S. Y. (2011). Learning english tenses through the theory of variation. *Journal of Asia TEFL*, *8*(2), 145–167. Azar. (2007). Grammar based teaching: A practitioner's perspective. *TESL-EJ*, *11(2)*, 1–12.

Azar. (2007). Grammar based teaching: A practitioner's perspective. *TESL-EJ*, *11(2)*, 1–12.

Azar, B. S., & Hagen, S. A. (2011). *Fundamentals of English Grammar* (Fourth Edi). Pearson Longman.

Baleghizadeh, S., San, Beheshti, S., & Oladrostam, E. (2010). The Effect of MALL on Grammatical Accuracy of EFL Students. *MEXTESOL Journal*, *34*.

Baugher, M. W. (2012). Explicit Grammar Instruction and the Acquisition of Second Language Verbal Morphology: A Framework for Generalized Learning in Second Language Acquisition. *ProQuest Dissertations and Theses*,

Bazzaza, M. W., Alzubaidi, M., Zemerly, M. J., Weruga, L., & Ng, J. (2016). Impact of Smart Immersive Mobile Learning in Language Literacy Education. *IEEE*, (April), 443–447.

Bikowski, D. (2018). Technology for Teaching Grammar. *TESOL Encyclopedia of English Language Teaching*.

Bowden, J., & Marton, F. (1998). *The University of learning*. London, Kogan Page.

Brown. (2001). *Teaching by principles, An interactive approach to language pedagogy*. Longman.

Brown, D. B. (2014). Mobile learning for communicative language teaching: An exploration of how higher education language instructors design communicative MALL environments. *ProQuest Dissertations and Theses*, (August).

Chomsky, & Halle. (1991). *The Sound Pattern of English* (MIT Press).

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340.

Ducey, A. J. (2013). Predicting Tablet Computer Use : An Extended Technology Acceptance Model. *Graduate Theses and Dissertations*, *Graduate t*(January), 1–97.

Dudeney, & Hockly. (2012). ICT in ELT: How did we get here and where are we going? *ELT Journal: Engllish Language Teachers Journal 66 (4)*, 533–542. https://doi.org/10.1093/elt/cc5050

Fuchs, M., Bonner, M., & Westheimer, M. (2012). *Focus on Grammar 3* (Fourth Edi). Pearson.

Ganapathy, M., Shuib, M., & Azizan, S. N. (2016). Malaysian ESL students' perceptions on the usability of a mobile application for grammar test: A case study of ESL undergraduates in universiti sains Malaysia. *3L: Language, Linguistics, Literature*, *22*(1), 127–140.

Harmer, J. (1991). The Practice of English language Teaching (Longman, p. 22).

Hartman, C. (2014). The Effect of Computer-Assisted-Language Learning on Micronesian Students' Writing Achievement. *ProQuest Dissertations and Theses*.

Hussain, Niwaz, Zaman, Dahar, & Akhtar. (2010). Technology based learning environment and in student achievement in English as a Foreign language in Pakistan. *International Journal of Academic Research*, (2(5)), 398–402

Jantke, K. P., & Hume, T. (2015). Effective Learning Through Meaning Construction in Digital Role Playing Games. *IEEE*, 653–656.

Jean, & Simard, D. (2011). Grammar learning in English and French L2. *Foreign Language Annals*, 465–492.

Jin, S. H. (2015). Implementation of Smartphone-based Blended Learning in an EFL Undergraduate Grammar Course. *Multimedia Assisted Language Learning*, 11–37

Krendl, A. & Clark, G. (1994). The Impact of Computers on Learning: Research on In School and Out-of-School Settings. *Journal Of Computing in Higher Education.*

Larsen-Freeman, D. (1991). Research on language teaching methodologies: A review of the past and an agenda for the future. *Foreign Language Research in Cross-Cultural Perspective*, 119–132.

Larsen-Freeman, D. (2015). Research into practice: Grammar learning and teaching. *Language Teaching*, *48*(02), 263–280. https://doi.org/10.1017/S0261444814000408

Li, Z. (2013). Mobile-Assisted Grammar Exercises : Effects on Self-Editing in L2 Writing. *Language Learning & Technology*, *17*(3), 135–156.

Lo, M. L. (2012). *Variation Theory and the Improvement of Teaching and Learning. Gothenburg Studies in Educational Sciences 323. Goteborgs Universitet.* https://doi.org/10.1007/s35834-013-0078-0

Ma, Z. H., Hwang, Wu Yuin, Chen, S. Y. &, & Ding, W. J. (2012). Digital game-based after-school-assisted learning system in English. *IEEE*, (Ispacs), 130–135. https://doi.org/10.1109/ISPACS.2012.6473466

Macia, A. (2012). The role of technology in teaching languages for specific purposes courses. *Modern Language Journal*, 89–104. https://doi.org/10.111/j.1540-4781.2012.01299.x

Malone, T. W., & Lepper, M. R. (1987). *Making learning fun: A taxonomy of intrinsic motivations for learning. In R. E. Snow & M. J. Farr (Eds.), Aptitude, learning, and instruction: III. Conative and affective process analyses.* Hillsdale, NJ: Erlbaum.

Marton. (2015). *Necessary conditions of learning.* Routledge, New York, NY.

Marton, & Booth. (1997). *Learning and awareness.* Mahwah, New Jersey, Lawrence Erlbaum Associates,.

Marton, F., & Pang, M. F. (2006). On Some Necessary Conditions of Learning. *Journal of the Learning Sciences*, *15*(2), 193–220. https://doi.org/10.1207/s15327809jls1502_2

Marton, F., Runesson, U., &, & Tsui, A. B. M. (2004). *The space of learning.* Mahwah, NJ: Lawrence Erlbaum.

Marton, & Runesson, U. (2003). The space of learning. In *Symposium Improving Learning, Fostering the will to learn, European Association for Research on Learning and Instruction, Padova, Italy.*

Marton, & Tsui, A. B. M. (2004). *Classroom discourse and the space of learning.* Mahwah, New Jersey, Lawrence Erlbaum Associates,.

Miangah, T. M., & Nezarat, A. (2012). Mobile-Assisted Language Learning. *International Journal of Distributed and Parallel Systems*. https://doi.org/10.5121/ijdps.2012.3126

Miller, G. A., & Nicely, P. E. (1956). *An anlysis of perceptual confusions among some English consonants*. J. Acoust. Soc. Amer.

Mystkowska-Wiertelak, A., & Pawlak, M. (2012). Production-oriented and Comprehension-based Grammar Teaching in the Foreign Language Classroom. *Springer*, 29–60. https://doi.org/10.1007/978-3-642-20856-0

Ni, Q., & Y. Yu. (2015). Research on Educational Mobile Games and the Effect it has on the Cognitive Development of Preschool Children. *IEEE Explore*, 165 -169.

Ongoro, C. A., & Mwangoka, J. (2014). Using Game-Based Approach to Enhance Language Learning for Preschoolers in Tanzania. *IEEE Explore*, 121–126.

Paris, T. N. S. T., & Yussof, R. L. (2013). Use of 'Time Trap Board Game' to Teach Grammar. *Procedia - Social and Behavioral Sciences*, *105*, 398–409. https://doi.org/10.1016/j.sbspro.2013.11.042

Politi, A. (2017). Mobile-assisted learning : designing Class Project Assistant , a research-based educational app for project based learning. *IEEE*, (April), 667–675.

Rodman, V. & Fromkin, R. (1993). Introduction to Language. Harcourt Brace and Co.

Roy, J. (2014). The perfect approach to adverbs, applying variation theory to competing models. *ProQuest Dissertations and Theses*. https://doi.org/10.1007/s13398-014-0173-7.2

Schwarz, R., & Braff, E. (2012). *We are no fun anymore*. Routledge Taylor & Francis Group New York.

Seaton, A., & Kirkpatrick, B. (2009). *Focus on Grammar Workbook 1*. Learners Publishing Pte Ltd.

Shima, T. N., & Rahmah. (2012). Enhancing Grammar Using Board Game. *Procedia - Social and Behavioral Sciences*, *68*(2011), 213–221. https://doi.org/10.1016/j.sbspro.2012.12.221

Soad, G. W., & Barbosa, E. F. (2016). Quality Evaluation of Mobile Learning Applications. *IEEE*.

Stroia. (2012). Learning with computers. A serious challenge for the didactic of foreign language teaching. *Revista Academia Fortelor Torestre*, *17(1)*, 38–42.

Suwantarathip, O., & Orawiwatnakul, W. (2015). Using mobile-assisted exercises to support students' vocabulary skill development. *TOJET: The Turkish Online Journal of Educational Technology*, *14*(1), 163–171. Retrieved fromhttp://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2015-15483-017&site=ehost-live&scope=site%5CnWiwatt48@hotmail.com%5Cnornprapat.s@bu.ac.th

Thorsten, A. (2015). How teachers' practice knowledge is used and challenged in a learning study using variation theory as a tool. *Emerald*, *4*(3), 274–287.

Tong, S. Y. A. (2012). Applying the theory of variation in teaching reading. *Australian Journal of Teacher Education*, *37*(10). https://doi.org/10.14221/ajte.2012v37n10.3

Ur, P. (1993). Grammar Practice Activities, A Practical Guide for Teachers (Cambridge, p. 4).

Ur, P. (1996). A Course in Language Teaching, Practice and Theory (Cambridge, p. 77).

Virvou, M., & Papadimitriou, S. (2014). Use of digital "Guess Who Board Game'' in Teaching English." *IEEE*.

Warschauer, M., & Healey, D. (1998). Computers and Language Learning: An Overview. *Language Teaching 31(02)*, 57–71.

Woodward, S. W. (1997). *Fun with Grammar*. Prentice Hall Regents.

Wu. (2012). Review of trends from mobile learning studies. A meta-analysis. *Computers & Education*, *59*, 817–827.