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# Ten Interesting Facts about OnVac: A Tool to Learn Engineering and Technology Vocabulary

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**Abstract**

The purpose of this paper is to impart interesting facts about an online vocabulary game namely OnVac, which can be used to learn engineering and technology vocabulary. E-mail interviews conducted with 32 students on a voluntary basis in a public university in Malaysia revealed positive perceptions of OnVac as an interesting tool to learn engineering and technology vocabulary. It implied that online games such as OnVac could facilitate university students to enrich their engineering and technical vocabulary. Since the vocabularies are selected from their core engineering and technical reference books, it seemed that OnVac was able to facilitate the students in understanding of their core subjects better. The study also showed evidence that OnVac enabled them to retain the engineering and technology vocabulary for both short- and long-term recalls.

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*Keywords*: Engineering vocabulary; Online vocabulary game; Technology vocabulary; Long-term recall; Short-term recall

## INTRODUCTION

The use of technology has made teaching and learning become more enjoyable in today's era (Klopfer, Osterweil, Groff & Haas, 2009). Online game, which can be played over computer network, is an example of technological tool that has been used in the educational setting. Apart from computer network, online games can also be played through other platforms such as game console, PDA or smart phone (Dortson, 2011). The use of online game, therefore, has prompted more educators to incorporate the tool into their syllabi. In education, the purpose of utilizing online games in teaching and learning is to encourage students to develop student-centered learning environment (David & Aldrich, 2007). Playing online games also creates powerful learning outcomes as it may increase students' retention and application in learning (Kapp, 2014), and serve as a very important role in learning and retaining vocabulary (Aslanabadi & Rasouli, 2013) especially for students at tertiary level (Dolati & Mikaili, 2011). With this in mind, a vocabulary online game called OnVac was developed particularly to assist tertiary engineering students to learn engineering and technology vocabulary, and this paper reports ten interesting facts about this newly developed OnVac.

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# LITERATURE REVIEW

## 2.1 The Use of Technology in Learning and Vocabulary Acquisition

Vocabulary plays a major part in second language acquisition and academic performance (Constaninescu, 2007). In learning vocabulary *per se*, conventional methods require teachers to execute word lists, glossaries and drills which help learners in a very little way, as these hinders their thinking capability to understand the meaning of the vocabulary through context. The use of computer technology to support learners' vocabulary acquisition has been discussed and further researched in finding better ways to assist learners attain new words. On one hand, technology enables students to utilize several learning styles which they might not have practiced before. On the other, technology offers various advantages in terms of contextual, active, self-paced and individualized learning, as well as automation. It is normally aimed to enable learners to choose appropriate learning content by developing understanding relating to their learning progress and achievement (Yip & Kwan, 2006).

In a study conducted by Neo, Neo and Yap (2008), it was highlighted that students liked having their own control in the learning process and found that participating in online learning was engaging and useful. It has also increased their understanding on the learning objectives. Also, the multimedia elements presented promotes learning motivation which made the learning session fun and kept them actively engaged. Similarly, the language learners in the experimental group preferred an online learning equipped with digital educational games to conventional activity-based lessons (Yip & Kwan, 2006). It gave them a sense of anticipation when playing the games and later they managed to perform greatly in vocabulary use throughout the lesson.

Chun and Plass (1996) presented remarkable results of their three studies, which were conducted with second year German students, who had used a multimedia application for vocabulary learning called Cyberbuch. They prepared a visual multimedia advance organizer to help the subjects learn new words. The study focused on examining the effectiveness of multimedia annotations on vocabulary acquisition. Furthermore, (Groot, 2000) has also presented a multimedia-enhanced-computer-assisted word acquisition program, CAVOCA which was aimed for language learners to acquire vocabulary in a short period. It functions as an interactive program which brings learners through various levels of vocabulary acquisition process. Additionally, Tozcu and Coady (2004) carried out a case study which highlighted the positive results in using interactive computer-based technology for learners' vocabulary acquisition. It showed that the subjects who used a tutorial computer assisted courseware were able to increase their vocabulary knowledge.

## 2.2 The Difference Between Online Games and In-class Activities

Rouse (2007) defines online games as the running of specialized application on machines using personal computers on the Internet. Juul (2003) explains that to play interactive online games, the player always has an outcome that he wants to achieve. In reaching for ones, he puts forth determination, and as a consequence, he may be attracted to the game. In Juul's words (2003):

> A game is a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values. The player exerts effort in order to influence the outcomes, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable.

When playing online game, a player may play alone or he may play with other players. For one player, the online game is played by one person and usually he chooses single-player mode when playing online game (Oosterhuis & Lukas, 2006). For multiplayers, Leung (2010) regards online game as an interactive and enjoyable activity that may allow social activity for children and adolescents. The social interactivity can be observed especially when children and adolescents play the Massively Multiplayer

Online Role Playing Game or MMORPG (Leung, 2010).

On the other hand, learning activities as a whole, as defined by European Union (in Litwinska, 2006) include the entire spectrum of formal, non-formal and informal learning. This range of approaches for learning enables learners to improve their knowledge, skills and competence. Any learning activity must be intentional, and therefore, the act has a predetermined purpose. Also, any learning activity is organized in some ways – be it with learners, content and strategies (Litwinska, 2006). In short, it can be understood that the difference between online game and in-class activities differ in terms of the mode they offer to learners. The former is conducted via online while the latter can be conducted conventionally. The former seems to be informal as teachers may not have to be in the classroom to teach their learners while the latter, may be conducted both in and outside classes.

## 2.3 Second Language (L2) Vocabulary Acquisition and Retention Using Online Game

A study by Hainey, Connolly, Stansfield and Boyle (2011) found that online game promotes a platform to contest the players themselves when playing online game. Their study found that students in one higher educational institution regarded that playing online games as challenging since they need to carry out certain tasks required by the game as well as face dangers and threats when playing one. In another study, Hou (2012) compared the learning of second language using online games between male and female gamers. It was reported that designing games with story narrative may increase female gamers' motivation in playing a game. Hou (2012) suggested that a massively multiple online role-playing game as it is used in the researcher's investigation needed to incorporate appropriate instructional design.

Playing online games, especially vocabulary online game, enable learners to learn a vast amount of new vocabulary. Juffs and Friedline (2014) conducted a study to identify Arabic and Korean adult learners' actions (e.g. looking up words) using online tool to learn vocabulary. One of the respondents with a pseudonym; Minseo, described that playing online games enabled him to "see" a lot of new vocabulary. He also preferred learning words with vocabulary games although he felt it was sometimes difficult to understand the words. In addition, the use of VirtUAM enabled undergraduates to learn German vocabulary related to different supermarket products (Berns, Gonzalez-Pardo & Camacho, 2013). Eighty five students taking a degree in modern languages, economics and engineering took part in the research. The study reported that the vocabulary that was presented in context integrated in VirtUAM made it easier for them to understand and learn new words.

With the advance use of technology, online games have been an integral part of learning a new language. It is becoming increasingly used in classrooms as to enhance students' creativity and proficiency. In addition, the use of computers benefits students in second language classroom in a variety of ways (Folse & Chien, 2003). L2 vocabulary acquisition through online games have also been created multimedia vocabulary learning environments, which attempts to assist learners to see the connection between visual and verbal representational systems in order to increase vocabulary knowledge with a means to bring positive effects on reading comprehension and the rate of speed for frequent word recognition (Tozcu & Coady, 2004). According to this study, it enabled students' to create individualized vocabulary practice that allows "students to add words to an individualized list for further study or setting reminders to help with words by synonyms, antonyms, translation or paraphrase" (p.56).

In another study, Horst, Cobb and Nicolae (2005) used concordance examples, online quizzes and online dictionary which he believed assisted students in reinforcing their reading comprehension as well as vocabulary retention. Similarly, web-based vocabulary such as multiple choice, cloze passages and fill-in the blanks activities that is combined with reading passages, automatic scoring and e-mail feedback and randomization were successful in developing form and meaning of the word (Nelson, 1998) . These has also successfully enabled students to place new words in a meaningful context and facilitated them in memorizing new words.

Groot (2000) believes there is a need to construct computer-assisted vocabulary learning environments with how words are acquired in mind, so that words learnt by learners are strongly embedded for long term retention. With this in mind, this led to developing a computer word assisted

program that encompasses noticing various properties of the new words in terms of morphological and phonological, semantic and syntactic sets, to further use such words in different contexts, which illustrates various properties. In addition, such software should enable both implicit and explicit vocabulary learning and train students' to be good vocabulary learners. This includes an introduction of vocabulary learning strategies that relates to imagery, verbal association and tips on how to memorize the word (Ma & Kelly, 2006).

## THE PRESENT STUDY

At tertiary education in Malaysia, it was identified that the most cited study on online game concerns with learning Arabic. In Sharir and Yusri's (2012) study on learning Arabic, it was reported that the online Arabic vocabulary game learning prototype was able to enhance Arabic vocabulary learning among learners. In learning English, however, to date, there is no specific online game that may assist students in learning the language in Malaysia. Also, there was no online game that contains engineering and technology vocabulary that may assist engineering students in understanding their core subject.

Based on the argument, to address the gap in vocabulary research, we developed an online vocabulary game called OnVac, and integrated within its content engineering and technology vocabulary. OnVac was therefore developed to address the gap in vocabulary research, and to cater the needs of engineering students who are struggling to understand technical materials in English. This development however requires analysis of the effectiveness of this new tool This paper therefore aims at investigating interesting facts about OnVac from the perception of students who play the game, using a qualitative approach. We attempted to shed light on the use of OnVac to arrive at a deeper understanding from these students' perspectives. The current paper reports on the results from one main question, namely: What do students find interesting in using OnVac to learn engineering and technology vocabulary?

## METHODOLOGY

This paper reports the findings of a small-scale study conducted in one of the engineering-based public universities in the East Coast of Malaysia.

### 4.1 Participants

Participants of the study were students ($n$=32) from three different engineering faculties at the university. These students were chosen because they were familiar with playing online games based on an initial communication about types of game, time spent playing game and features of favorite game.

Purposive sampling was used to select the participants for the study (Oliver, 2006). Specifically, we chose typical case (median) sample as the form of purposeful sampling in this current study since it is the most common sampling technique in a qualitative study. The most productive students were selected in giving their views and ideas about online games. Another point worth mentioning is that majority of the participants involved in the study were male students. Of the ethnicity of students, five were Chinese, two were Indians and the remaining students were Malays. Majority of them were in their third to fifth semester of study.

### 4.2 Research Material: The Online Engineering and Technology Vocabulary Game (OnVac)

OnVac is a game that enables students to learn engineering and technology vocabulary. The vocabularies used in the game are selected from students' course books in electrical electronics, manufacturing, mechanical, civil, chemical, computer sciences and engineering technology. The game offers 76 engineering words for students to learn. On the main screen, tabs–Register/ Login, About OnVac, About Teachers, Contact Us can be found. In addition, OnVac integrates eight activities or slots,

which include Vacuum-beaker, Order-Words, Parts of Speech, Fill-in-the-blanks, Synonym-Antonym, Word Search, XPlotube and Crossword Puzzle.


**Figure 1.** Screenshot of OnVac's main page

The slots available on OnVac:

1. Vacuum Baker - students are required to match words on the left of the screen to the one that is on the right. They need to place a cursor on the target word and drag it into boxes on the right. Each correct score receives one point. Students may learn words for instance *ductile, evolve, ferrite* and *rupture* in this slot.
2. Order-Words - the words are scrambled and students are required to drag letters and place them in boxes provided. As an illustration, the word, *fulcrum* is scrambled and written as *urulmc* while the letter 'f' is provided as a hint. Students, therefore, need to arrange the letters in obtaining correct answer for the item. Besides that, another two hints are provided at the bottom of the screen. These hints define the scrambled words. *Pivot*, *soldered, sculpture* and *pawl* are some of the words that a student can learn in the slot.
3. Parts of Speech - students guess the part of speech of a targeted word. For instance, they need to identify the part of speech for the word *frictional* whether it is an adjective or adverb. A sample of sentence written as 'How is it used in a sentence' on the screen serves as a hint for students to guess the part of speech for the targeted word.
4. Fill-in-the-blanks - students drag targeted word on top of the screen to boxes in order to complete a sentence. In answering an item, 'The _____ of the metal bar was inadaptable; students need to drag the word *beam* to obtain a score. Students may also learn synonym and antonym in OnVac.
5. Synonym-Antonym - enables students to enrich their vocabulary knowledge of these words by knowing the synonym or antonym of these words; *intricate, insulate, repulsive*; to name a few. In playing the slot with targeted word *repulsive* students need to move cursor to the options *popular* or *attractive* to identify its antonym. Those who choose the word *popular* score a mark.
6. Word Search - students initiate the game by reading the list of words; *accumulator, shaft, pulley* and others, which are placed on the right. Then they look at the puzzle

containing the scrambled words on the left. These words are in all directions - vertically, horizontally and backward. Students, therefore, move the cursor horizontally, diagonally or backward by circling each letter of a word found and strike it off the list.

7. Xplotube - requires student to type correct letter in the blank spaces. If they choose a wrong letter, the letter chosen will not appear and the tube explodes as its result if students obtain seven wrong answers. However, if they get the answer right, the color of the substance in the tube stays the same as where it last stops. Students may ask for clues by clicking Hint 1 and Hint 2 in learning words such as *macroscopic*, *oscillator* and *permeability*.
8. Crossword Puzzle - students may identify word associated with technical clues provided. They need to ensure that they correctly insert correct letters into the spaces provided to move onto the next word in the box of the crossword puzzle. *Impedance*, *tangential*, *prismatic* are some of the words students may learn playing the slot.

## 4.3 Research Instrument

An interview protocol was used as the main research instrument in the present study. The interview questions consist of four open-ended items. In the first item, students were required to express their views on OnVac as a whole in assisting them to learn engineering and technical vocabulary. The second item asked them whether or not the game can be recommended to other students. The third item concerned with asking their opinions on the features they preferred using OnVac. The final item requested them to describe the features they thought needed changes in OnVac.

The interview protocol, both for competent and basic leaners, was obtained from a colleague in the Centre for Modern Languages & Human Sciences (CMLHS) in the university. She also validated the L1 version for the latter learners. This was necessary since any instrument that is translated into another language must again be subjected to further analysis for validation (Grifee, 2001). Meanwhile, a peer review was carried out by asking a colleague to comment on the findings as they emerged for the purpose of ensuring its reliability (Merriam, 1998). This is to ensure the credibility of and trustworthiness of the data obtained.

## 4.4 Data Collection Procedures

Thirty two students participated in the interview, which was conducted via email. In collecting data for the study, students attending classes taught by the research team were selected, due to the feasibility in monitoring the collection of data. Before the interview was carried out, students were instructed to play OnVac for twice outside the class hours. The procedure was as such, since time was limited to let them play during class hours. The first time they were instructed to play OnVac was in the first week whereas the second time they played OnVac in their third week. Students were informed that they might play the game as many times as they preferred. Later, in week five, interview questions were emailed to them.

## 4.5 Data Analysis

Four stages of data analysis were involved in the current study. The first stage involved organizing and preparing data for analysis. All e-mail interviews were printed and were given to each of the five researchers. In the second stage i.e. after everyone had obtained the email interviews, each of the research team members carefully read and transcribed them. As the analysis was done conventionally, important information or details that were found from the emails were highlighted. This was done by scanning the emails to get the general sense of what the students found interesting about OnVac (Creswell, 2005). Notes were jotted in the left margin of the emails to get students' general thoughts of the online game. Next, the third stage took place where we began the detail analysis of coding the e-mail interviews. The interview data was segmented to bring meaning to the information we had gathered. This was done by reading each script carefully and trying to get the underlying meaning of what was said by the participants (Creswell, 2005). After reading all the e-mail interviews, a list of all topics were developed

which was related to the main question of the study. This was done by scrutinizing the most descriptive and relevant wording from the e-mail interviews. Later, the topics that were related to each other were grouped. This enabled the research team to label the categories that were derived after grouping the topics. In coding, topics were selected that was figured by readers that would find it interesting. At the final stage themes were developed that would serve as the major findings of this study. The themes were interconnected to show their importance by making a list of the categories that were drawn from the interview data.

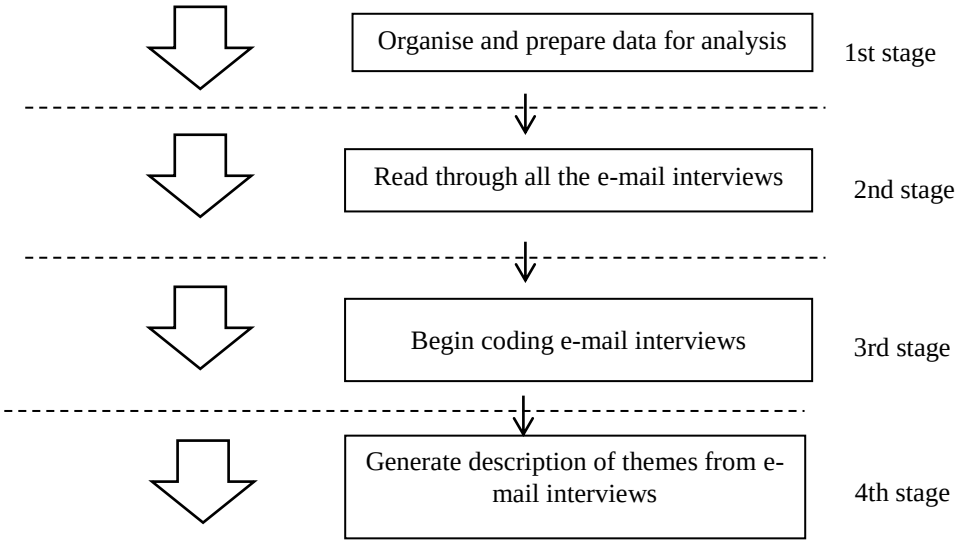


**Figure 2.** Process of analyzing data

## FINDINGS

Findings from this study enabled us to make a list of categories on the interesting facts about OnVac in learning engineering and technical vocabulary. The two categories are learning benefits and game features. The themes of the categories are shown in Figure 3.

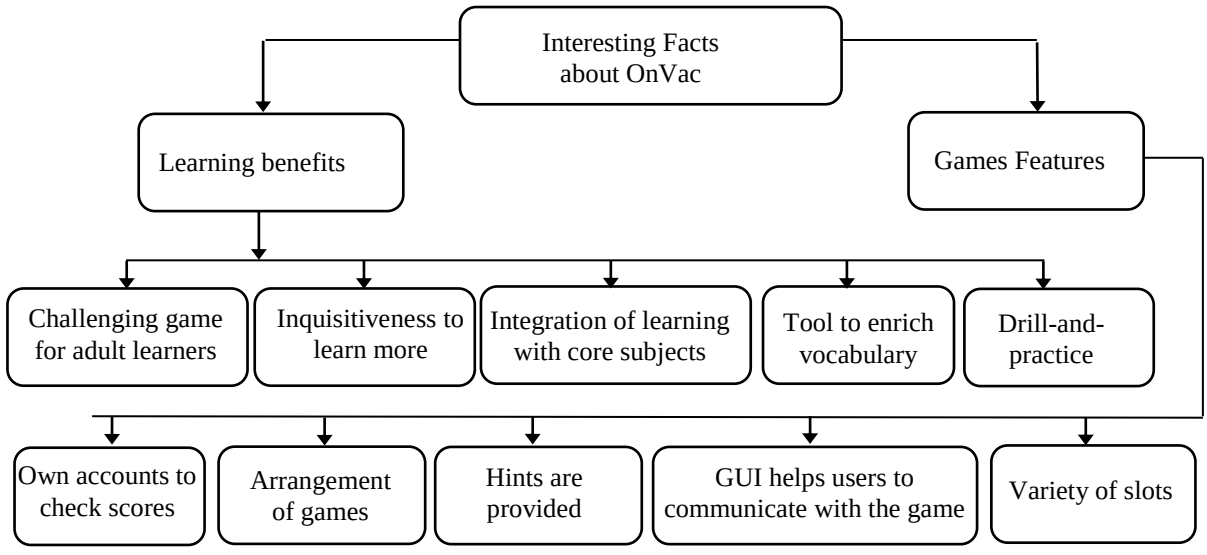


**Figure 3.** Interesting Facts about OnVac

In the first category; learning benefits, a few themes derived were 'challenging game for adult learners', 'inquisitiveness in learning more', 'integration of learning with core subject', 'tool to enrich vocabulary' and 'drill-and-practice'.

In 'Challenging game for adult learners', participants found that OnVac provides challenging slots namely Order Words, Crossword Puzzle and Xplotube for them as students at tertiary level education. This can be seen from their responses:

*Student 3: "... It is challenging for an example Order Words".*
*Student 5: "... the games are quite challenging".*
*Student 8: "... the puzzles are also very interesting and challenging".*
*Student 15: "... I like the games because it's quite challenging".*
*Student 22: "... xplotube is quite nice and challenging".*

Participants reported that OnVac had facilitated them to understand meaning of words related to engineering and technical fields in the theme 'Inquisitiveness in learning more'. Student 6 remarked, "… the gaming platform has provided a more simply and understanding meaning for the word". Besides having fun playing OnVac, Student 17 felt that the vocabulary used facilitated student in learning before and during engineering lessons. He/she claimed, "… [I] feel it [Onvac] can provide more fun during lessons…. we need such vocabulary to get more information before and during the lesson".

In the theme, **'**Integration of learning with the core subject', participants reported that games can be a channel that can facilitate them in learning. Using OnVac integrates the learning of their core subjects with that of playing the game. This is due to the vocabulary in OnVac which was selected from students' course book. Student 10 argued that the vocabulary that was used in OnVac matched with the ones he had learnt in their engineering subject. He said, "There are many technical vocabulary used that [are] relevant with the subject that is being studied in engineering courses". Student 5 realized that the words used in OnVac are very much related to his/her field. He reported, "

*"When I play over the games, I found that there are large number of specific and scientific terms which really should be learnt by an engineering student".*

In fact, Student 17 claimed that the use of engineering vocabulary as it is used in OnVac creates excitement while facilitating students in their lessons. He explained,

*"It is a new style of learning especially for those who [are] studying engineering. I also feel it offers more fun during lessons".*

In addition, the theme; 'Tool to enrich vocabulary' revealed that OnVac provides a tool for students to enrich their vocabulary knowledge in engineering as Student 5 put it, "It is undeniably [that OnVac] can provide a lot of good and specific words for student to widen their knowledge". Moreover, the use of OnVac helped them to understand engineering vocabulary better as Student 4 reported, "OnVac really helped me to understand more on [of] engineering term". It is also one of the alternatives to learn engineering vocabulary rather than just reading books. Student 4 further revealed, "It is a good medium for engineering student to learn more about engineering terms besides reading books". Other students commented that OnVac can be used as a tool to enrich vocabulary because it is able to boost and improve students' engineering vocabulary. The extracts below demonstrated these comments:

*Student 6: "... I assume it can boost up the engineering vocabulary of a student"*
*Student 23: "... it is a great program to improve our vocabularies in engineering".*

Finally, the theme 'Drill-and-practice' concerns with students' ability in playing the slots in OnVac as many as time they preferred. If they are not satisfied with their scores the first time they play it, they could play it again. Therefore, it provides a platform to test their understanding, and consequently memorize the use of the targeted vocabulary. Student 18 commented, "… [OnVac is] very good for [to] retest/measure ourselves for [in order to] understand/what we had learned before. This can make me remember the meaning of the words". Moreover, playing the game for a number of times promotes retention as well as makes them understand grammar rules. Student 3 remarked, "… [the] program

[OnVac] help[s] us to remember what we have learned and had helped resolve the grammar problem". It gives them the opportunity to practice English vocabulary that is used in engineering in a fun way. Student 19 said, "It will make the student enjoy during learning and practicing their English in their engineering course". While Student 3 reported, "This program [OnVac] is nice to help students to remember some term[s] that [is] use[d] in [the] engineering field.

In the second category, the themes categorized were: 'Own accounts to check scores', 'Arrangement of game', 'Hints are provided', 'GUI helps users to communicate with the game', and 'Variety of slots'.

In the theme, 'Own accounts to check scores'; it was found that students were happy that they could know their progress after they played OnVac. One student believed that having his/her own account also would help teachers' to be aware of their students' development. Student 1 reported,

> *"... student also can have their own account that would allow the teacher to check their scores". However, Student 6 argued that it was not simply a matter of knowing students' scores since more priority should be provided by giving hints in helping them to answer questions in OnVac. He said, "... hints should be given in every game so that it won't make the game too tough to score".*

Another theme, 'Good arrangement of game', enables respondents to select the slot they want to play according to their own preferences. They may click to any slot -Vacuum-beaker, Order Words, Parts of Speech, Fill-in-the-blanks, Synonym-Antonym, Word Search, XPlotube and Crossword Puzzle – to start playing the game. Student 1 stated,

> *The feature I like most on OnVac is the arrangement of the game [that is] according [to] manner [it appears]". In fact, it is systematically arranged. Student 5 claimed, "I like the game zone in the OnVac, the games are arranged very systematically ...*

In the theme, 'Hints are provided', respondents found that the hints that are provided in OnVac had facilitated them in thinking of the appropriate answers. In XPlotube, for instance, 'Synonym' and 'Definition' are used as hints to help them figure out correct answers. In fact, the hints simulate their interest in playing one slot in OnVac i.e. XPlotube. Student 22 described, "… Xplotube is quite nice and challenging even though there [are] hints provided". However, Student 6 felt that hints should be provided in all slots of OnVac. He claimed that such move was necessary to ease scoring "…hints should be given in every game [slot] so that it won't make the game too difficult to score".

In addition, the Graphical User Interface (GUI) in the form of text and graphics in OnVac enables students to interact with its content. This is the theme shown in 'GUI helps users to communicate with the game' The menu bar gives information for teachers by clicking 'For Teachers'. Another text that is useful is 'About OnVac' that allows users to read brief information about the game. On the other hand, the futuristic graphic background in green makes it seems to add enjoyment when playing the game. Student 32 said, "I belief students will be attracted to the graphics which has been the reason why they enjoy the computer games [OnVac]. Student 21 claimed that the combination of the graphic and background music makes him/her comfortable in playing OnVac. He/she said,

> *".. good graphic and suitable background music enable players to play the game comfortably".*

Moreover, the graphic and sound features could instill interest in students playing the game. Student 21 confessed that the features interest him especially when he played one slot of OnVac; XPlotube,

> *"I am really interested playing each game especially Xplotube, with a nice graphic and sound, it will easily make the student feel interested".*

The features also help students in learning the vocabulary in OnVac on their own. Student 24 remarked,

*"It is a good try for students to learn new words form this online game which has a nice*

*graphic and sound effect. Hence, it helps to promote the student's interest to learn vocabulary by their own-self".*

Student 30 makes a comparison between OnVac with Tell Me More, a language software. The student believed that the former GUI is more interesting than the latter stating that;

*"I can say that it was a good website which are more interesting in graphical user interface(GUI) rather than Tell Me More which is commonly used in the English subject [University's English compulsory subject]"*

Finally, the various slots namely Vacuum-beaker, Order Words, Parts of Speech, Fill-in-the-blanks, Synonym-Antonym, Word Search, XPlotube and Crossword Puzzle in OnVac enables students to improve their vocabulary. This is the theme under 'Variety of slots'. Student 7 put it, "… [there are] plenty of exercise[s] [slots] provided for the students and the use of this programme [OnVac] will greatly help students to improve their vocabulary. Indeed, Student 5 argued that these slots are brain stimulating as he described, "…it [OnVac] has many types of games [slots] that are brain-stimulating"

## DISCUSSIONS

The first theme i.e. learning benefits resulted in a few themes 'Challenging game for adult learners', 'Inquisitiveness in learning more', 'Integration of learning with core subject', 'Tool to enrich vocabulary' and 'Drill-and-practice', while the second theme i.e. game features produced a few themes: 'Own accounts to check scores', 'Arrangement of game', 'Hints are provided', 'GUI helps users to communicate with the game', and 'Variety of slots' – entail that the participants who participated in the current study showed positive attitudes using OnVac in learning engineering and technology vocabulary. Similar result was found in Huyen and Khuat's (2003) study. Students in their study viewed that online game was fun and helpful in learning vocabulary. The findings of the current study also corroborated with Muhammad Kamarul Kabilan, Norlida Ahmad and Mohamad Jafre Zainol Abidin's (2010) study. It was reported in their study that students showed a positive attitude towards learning vocabulary using online game in Facebook. This is so when they made efforts to look up the meaning of the words they did not understand.

Concerning the first theme on learning benefit, as a whole, participants claimed that OnVac gave them the opportunity to learn engineering and technology vocabulary. Such was so since the online game differs from other online vocabulary game as it caters for their needs as engineering and technical students. It is encouraging to compare this finding with that of found by Muhammad Kamarul Kabilan, et al. (2010). Their study reported that Facebook enabled their participants, specifically undergraduates in Universiti Sains Malaysia (USM) to learn new words in such a way that they would be finding the meaning of the words they did not know after their friends commented about them in the social website.

With regards to the second theme on the games features, generally, it was found that the game features in OnVac enables students to memorize the meaning of words learned. This finding is in agreement with Liu and Chu's (2010) study; in that students could improve their ability in retaining words better compared using online game compared to using non-gaming method. In fact, their study showed that the use of ubiquitous learning environment; Handheld English Language Learning Organization (HELLO), enabled students to achieve better learning outcomes as well as motivate the latter in learning more positively. In addition, the system operation of one's online games enables students to be motivated playing the game, and consequently assist them in memorizing words (Huang, Huang & Tschopp, 2010). The system operations satisfy students in their study in such a way that it had motivated the former to be more attentive, and confident in playing Digital game-based learning (DGBL).

## CONCLUSION

Last but not least, the findings of this study are significant because they may facilitate teachers

attempting to develop their own vocabulary game for their learners. More importantly in developing a game, it should be emphasized that teachers should take advantage of their students' interest in learning vocabulary using online game. As demonstrated in the current study, students were interested in learning vocabulary using OnVac due to its instructional design. The GUI use in slots such as Order Words, Crossword Puzzle and Xplotube; to name a few; interest them in learning vocabulary using OnVac. In light of this point, further research on OnVac should examine the effectiveness of each slot to encourage vocabulary growth of the students. Moreover, Conrad and Donaldson (2011) argue that various learning styles and needs of students should be the priority in designing games for them. These two factors are vital for they "influence the design of effective engaged learning activities for the online environment" (Conrad & Donaldson, 2011, p.8).

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