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VocaMono: An Online Multiplayer English Vocabulary Learning Board Game

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Abstract: It is imperative to construct a learning environment to make EFL (English as a Foreign Language) learners have an engaged vocabulary learning experience to enhance their learning interests. Recently, digital game-based learning suggests a new learning paradigm of learning by playing within visual and interesting environments. As a consequence, this study developed an online multiplayer English vocabulary learning board game, named *VocaMono* (short for *Vocabulary Monopoly*), for English vocabulary learning. Adapted from the famous games *Monopoly*, *Unscramble*, and *Scrabble*, this study developed *VacaMono* by effectively integrating the gameplay and pedagogy designs for vocabulary learning. *VocaMono* has been designed to have unique educational game characteristics that should be of interest to vocabulary learning. It enhances learners' motivation for learning and memorizing English vocabulary. By playing this educational game, players' are able to enhance their vocabulary acquisition abilities not only for correctly spelling taught vocabulary but also for discovering spelling patterns. This game can fit players' vocabulary levels by selecting words from the word scope. Furthermore, this game is possible to be used to correspond to the class progresses.

Keywords: English vocabulary learning, game-based learning, online game, multiplayer game

1. Introduction

In the globalized society, English communication competence is indispensable so that learning English has become a part of lives in many non-English speaking countries. Learning another language is not easy at all (Turgut and Irgin, 2009). It is important to find the threshold for language learning. Vocabulary is the foundation of a language and the core of learning and communication. They are the cornerstone of a language, from which sentences, paragraphs, and articles are formed. Laufer (1986) noted that there would be no text comprehension without understanding the text's vocabulary. It has been suggested that vocabulary competence has more contributions to language comprehension than the components of reading (Chen, 2011). Increasing vocabulary abilities can effectively enhance reading comprehension and vocabulary learning has been recognized as a central part in language learning (Chen, 2011). Language development, therefore, is highly dependent on learners' vocabulary acquisition abilities (Carol, 2001).

The most serious obstacle is not lack of various reading strategies but insufficient English vocabulary (Chen, 2011). Without knowing enough words, people cannot acquire fluent language competences neither for listening, speaking, reading, nor writing. Therefore, EFL (English as a Foreign Language) learners, particularly beginners, should be given explicit instruction to memorize and practice the basic level words through the repeated exposure so that they can automatically recognize words and enjoy reading (Chen, 2011).

To enhance vocabulary acquisition abilities, practice is indispensable. Shemesh and Waller (2000) even said that for vocabulary learning, "No practice, no learning!" Chen (2011) mentioned that "for beginners, it may be more appropriate and effective to learn English (vocabulary) in a direct and explicit way." However, vocabulary acquisition is usually the most difficult part during the learning processes for most EFL learners.

Most English vocabulary practicing activities are based on monotonous and tedious approaches so that many learners lack motivation to learn spelling words repetitively and do not learn English vocabulary effectively. For most learners in Taiwan, vocabulary learning is a terrible experience even though they spend much time. They usually think it is boring and even hate to memorize vocabulary.

The learning outcome is often limited and even frustrating (Chen, 2011). Therefore, how to improve learners' English vocabulary abilities has become an unavoidable issue and it is imperative to construct a learning environment to make EFL learners have an engaged vocabulary learning experience to enhance their learning interests.

Contemporary students are digital natives who grew up with the computer. Applications of information technologies on educational contexts are increasingly getting popular for them. Among the computer applications, educational games have got more interest by integrating learning materials into computer games to promote student-centered learning activities to help students drill facts, connect ideas, or synthesize discrete knowledge (Nettleton, 2008). Many studies have found that games can stimulate learners' motivations and enhance their learning experiences across multiple disciplines and ages (Chen, 2011). Digital educational games suggest a new learning paradigm of learning by playing within visual and interesting environments to capture learners' interests, encourage active learning, develop learning by doing, and trigger motivation and enjoyment (Regueras et al., 2009). While playing games, learners as players take control of the learning processes so that they are more willing to learn actively (Chen, 2011). One characteristic of computers is their "patience" in repetition and recycling tasks which conform to the repeated exposure and practice requirements of effective learning so that educational games can be particularly effective in learning boring materials such as vocabulary learning (Chen, 2001; Prensky, 2001).

Competition is one of the game characteristics to stimulate players' motivation. Regueras et al. (2009) stated that learners can achieve better comprehension, retain the information longer, and enjoy learning more with active learning methodologies which can be structured to force learners to compete each other in multiplayer games. The nature of multiplayer games can take the advantages of competitive learning to stimulate learners' motivation which in turn promote learning and sometimes shorten the whole learning processes (Burguillo, 2010; Regueras et al., 2009).

As a consequence, this study aims to develop an online multiplayer educational game, named *VocaMono* (short for Vocabulary Monopoly), for English vocabulary learning. It is expected to enhance learners' motivation for learning and memorizing English vocabulary.

2. *VocaMono* Game Design

Garcia et al. (2008) suggested that the easiest way to ensure entertaining value of educational games is to adapt existing popular games to be integrated with the learning goals. *VocaMono* integrates the gameplay and pedagogy designs by being adapted from three popular games, *Monopoly*, *Unscramble*, and *Scrabble*.

Monopoly is selected as the base because it is a well-known, classic, and popular amusing board game with broad target audiences. It is one of the board games into which different content domains can be integrated. Many computer games have been adapted from it and people are familiar with this game. *Unscramble* and *Scrabble* are both spelling games of word knowledge to stimulate players to rapidly retrieve appropriate words from memory through the visualization of spatially aligned alphabets (Halpern and Wai, 2007). They can enhance players' vocabulary abilities not only by recalling words on their current spelling list but also by constructively finding new words. *Scrabble* defines alphabets' points based on their possibilities to form words so that players are encouraged to spell more difficult words. The points of a spelled word are based on the sum of each alphabet's point and its location on the *Scrabble* game board.

VocaMono is developed under the client/server architecture. Being adapted from the famous game *Monopoly*, though being added with vocabulary learning activities, *VocaMono* is designed as a competitive multiplayer game which has similar gameplay rules with which players are familiar. Each player has two attributes: *money* and *credit*. The ultimate game goal of a player is to become the richest player. Figure 1 illustrates the *VocaMono* game board interface.

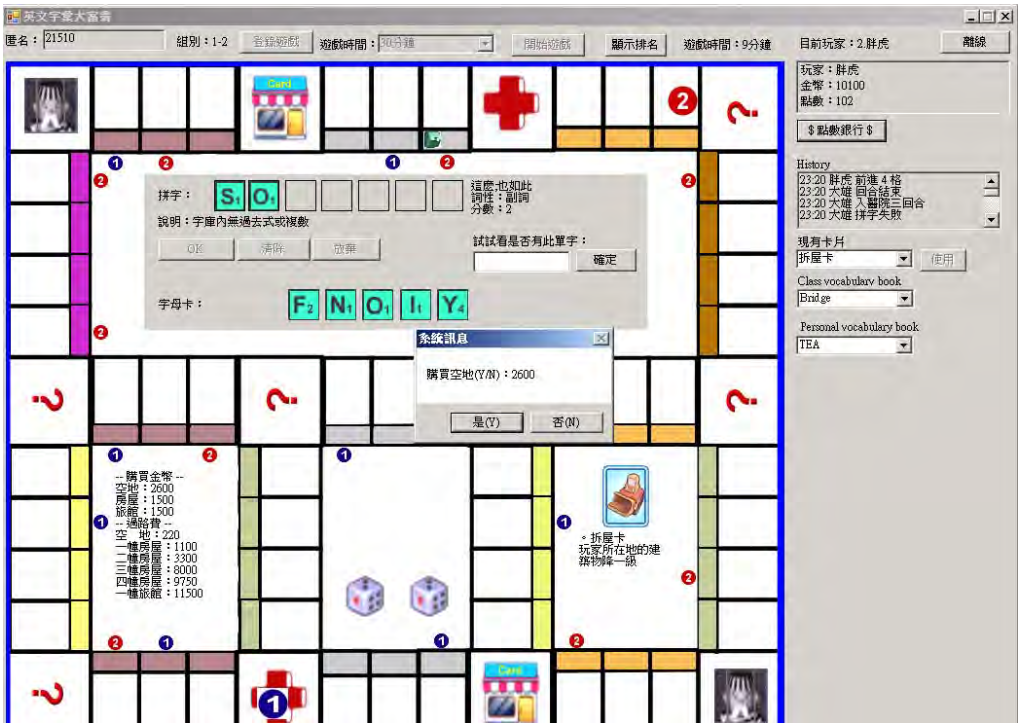

Figure 1. Illustration of *VocaMono* game board interface.

This game is turn-based. Players take turns in order. Each turn, the player complete his/her actions such as using cards or spelling a word within 30 seconds and these actions are sequentially listed in *History* box. The player first click two rolling dices to show the number of steps which his/her token moves forward along the path on the game board. The vocabulary learning activities are integrated into the gameplay rules by requiring the player to find a correctly spelled word by dragging and dropping a series of alphabet tiles which are selected according to the defined pedagogical scopes. Spelling words correctly can increase players' credit points. Players can find words either by recalling from memory or by trial and error with any combination of alphabets. A system embedded dictionary can facilitate players the trial and error process. If a word is correctly spelled, the word's Chinese translation and type (noun, verb,…) will be shown and the player's credit points increase based on the sum of each alphabet's point. Points and selection probabilities of alphabets are adopted from the famous spelling game *Scrabble* (Table 1). In this game, the default number of alphabet tiles is seven. In each turn, the system firstly randomly selects a word from the vocabulary database, whose length does not exceed seven alphabets. If the length of a selected word is less than seven, the remaining tiles are randomly chosen. These selected alphabet tiles are then presented with a random order. For example, if the word **PLAY** is selected and the remaining three alphabets **I, G,** and **E** are randomly selected with the presenting order $\mathbf{A_1}$, $\mathbf{P_3}$, $\mathbf{Y_4}$, $\mathbf{G_2}$, $\mathbf{E_1}$, $\mathbf{I_1}$, $\mathbf{L_1}$ (the subscript is the credit point of each alphabet). Players can find words with any combination of alphabet orders. With this design, players can find the target word, **PLAY** (3+1+1+4=9 points), or other words, e.g. **LIP** (1+1+3=5 points).

Table 1: The alphabet points and selection probabilities.

Point	Alphabet(Probability)
1	A(.09), E(.12), I(.09), L(.04), N(.06), O(.08), R(.06), S(.04), T(.06), U(.06)
2	D(.04), G(.03)
3	B(.02), C(.02), M(.02), P(.02)
4	F(.02), H(.02), V(.02), W(.02), Y(.02)
5	K(.01)
8	J(.01), X(.01)
10	Q(.01), Z(.01)

When a player's token moves forward along the path and stops at or passes a space, several options may be available to him/her depending on the definitions of that space. In *VocaMono*, a space can be a property, *Shop*, *Chance*, *Hospital*, *Jail*, or *Intersection*. Properties are the only spaces that can be bought and developed by players to collect rents as opponents stop at. If a player's token stops at a property that no one owned, this player can buy the property with the listed purchase price. If a player's token stops at his/her own properties, this player can construct a house, or develop the level for a constructed house to this property, and its rent will be increased accordingly. A house can have at most five levels. If a player's token stops at a property already owned by another player, this player pays the owner a given rent, depending on its level of development and whether the property is part of a set. A property set includes properties with the same color. If several properties within the same set are owned by the same player, the total rent to pay is the sum of rents of these properties. During the gameplay, the player can exchange credit and money at *Bank* anytime and trade a variety of cards with different credit points as he/she stops at *Shop*. Two types of cards are designed to increase the playfulness: *Self-reinforcement* and *Trap* cards. *Self-reinforcement* cards are those cards to increase self-competitiveness (e.g., "controlling dice numbers"). On the other hand, *Trap* cards can be used to attack others (e.g., "destroying one opponent's house"). The player can check the list of currently owned cards and use cards before spelling words. If a player's token stops at *Chance*, a random event, with different probabilities, will be triggered. Events include actions needs to occur (e.g., "go to *Jail*", "backward 3 steps"), obtaining bonus cards, etc. If a player stops at *Hospital* or is injured, whether by events triggered at *Chance* or by being trapped by another player, his/her token moves to *Hospital* wherever the token is, and ceases moving for three turns. A player's token moves to *Jail* and ceases moving for three turns when his/her token stops at *Jail*, the "go to *Jail*" event is trigger at *Chance*, or he/she is trapped by another player. The difference between dwelling at *Hospital* and *Jail* is that this player can collect rents while dwelling at *Hospital*, however no rent collection is allowed during dwelling at *Jail*. An *Intersection* is any space that has multiple directions to move forward. If a player's token stops at or passes "*Intersection*", the moving direction will be randomly assigned to increase the uncertainty of gaming to increase players' motivation (Lo et al., 2008).

In addition to luck and gameplay skills for playing games, knowledge skills in pedagogical content must be considered in educational games. *VocaMono* integrates the word scope corresponding to the learning goal into gameplay rules to enhance learners' vocabulary acquisition abilities with joyful experiences. Three pedagogical scaffolding tools, *Class vocabulary book*, *Personal vocabulary book*, and *Dictionary*, are developed to facilitate learning (see Figure 1). *Class vocabulary book* includes target words corresponding to class progress and the current learning goal is to facilitate players to acquire these words. The selection probabilities of words in *Class vocabulary book* are much higher than other words to make players have more opportunities to practice. Furthermore, to encourage players to practice words in *Class vocabulary book* to achieve the learning goal, if a word in *Class vocabulary book* is correctly spelled, double credit points will be rewarded for this word which yields high point values. All players share the same *Class vocabulary book* and they can always look up *Class vocabulary book* as references to find words. *Class vocabulary book* lists the target words to be learnt and raises players' interests by doubling the credit points, hence enhance their adherence to learn target words. Unlike *Class vocabulary book* is shared by all players, *Personal vocabulary book* records the correctly spelled words of an individual player during the gameplay. The player can review his/her own *Personal vocabulary book*. At the end of the gameplay, *Personal vocabulary book* provides summary of players' learning report, which can be used to estimate their competence of vocabulary learning. *Dictionary* is designed to facilitate players to implement the trial and error process in spelling and recognizing words.

3. Pedagogical Contributions of *VocaMono*

VocaMono has been designed to have unique educational game characteristics that are of interest to vocabulary learning. First, Ang and Zaphiris (2006) mentioned that in educational games, there are two types of winning rules: macro and micro. Macro rules define the ultimate goals. Oriented toward macro rules, the player devises individual micro rules to achieve the goal. Micro rules can be important in

educational games in that they can function as guidance to steer players toward the learning goals. Word spelling practices in *VocaMono* are embedded micro winning rules to achieve the ultimate goal of becoming the richest player (macro winning rule). Players are motivated to find higher-point words, which are target words to be learnt and are usually more difficult than words with lower points.

Second, players need to simultaneously integrate four cognitive abilities to successfully play the game within limited time: verbal, visuospatial, numerical, and strategic abilities. Verbal ability can be enhanced because *VocaMono* requires players to rapidly retrieve appropriate words from memory or trial and error. Players find words by dragging and dropping alphabets from a series of random ordered titles which is related to visuospatial ability. Players also use their numerical ability to play *VocaMono* because they need to rapidly calculate the points a word can earn. In such a competitive game like *VocaMono*, players need to apply strategic ability to make skillful thinking and planning to defeat their opponents.

Third, one of the fundamental language skills is to organize and remember the correct order of the alphabets in a word (Shemesh and Waller, 2000). In *VocaMono*, the vocabulary acquisition practice is integrated into the gameplay rules by requiring the player to find a correctly spelled word by dragging and dropping from a series alphabet tiles. It is consistent to the results as surveyed by Halpern and Wai (2007): most *Scrabble* players, both experts and novices, think about forming words by physically moving the tiles.

Fourth, requiring players to form words from a set of alphabets can facilitate players to tell apart words and non-words hence find spelling patterns. Shemesh and Waller (2000) proposed that teaching vocabulary with the idea of spelling patterns can be effective and students like to acquire vocabulary through spelling patterns. Through playing *VocaMono*, players enhance their vocabulary acquisition abilities not only for correctly spelling taught vocabulary but also for finding new vocabulary and spelling patterns. As addressed by Halpern and Wai (2007): "the visualization of spatially aligned letters that create partial word combinations using implicit rules of how letters combine in English to create words (e.g., *thr* is a common alignment of letters; *rht* is not)…".

Fifth, Garcia et al. (2008) suggested that a key design concern for spelling games is to avoid showing wrongly spelled words. Therefore, spelling games based on question answering, which remind testing by presenting correct and wrong spellings, could undermine both the entertaining and learning goals. *VocaMono* requires players to find a word from a set of disordered alphabet tiles. The alphabets must be arranged in correct order. Though the alphabet tiles are disordered, incorrect words are not shown to players. It fulfills the design requirement, suggested by Garcia et al. (2008), to avoid visual learning of misspellings.

Finally, it has been recognized that fitting players' knowledge levels and class progresses is a critical criterion to select educational games for maintaining players' motivation and enhancing their learning (Chen, 2011; Uzun, 2009). The design of *Class vocabulary book*, *Personal vocabulary book*, and *Dictionary* conforms to what Halpern and Wai (2007) addressed that in the context of vocabulary learning, most people learn and retrieve words by relying on their stored lexicon of word meanings and they have relatively few words in their lexicon. Furthermore, it fulfills principle of challenge for motivation (Malone and Lepper, 1987) to allow players to be challenged at their current skill levels (Alessi and Trollip, 2001). It also conforms to the flow theory (Kiili, 2005; Lin et al., 2010) in that the balance between players' skills and game challenges are successfully balanced by the predefined word scope. It includes the players' prior knowledge and class progress and gives them appropriate challenges to help them construct new knowledge. During the gameplay, to win the game, players do their best to find correctly spelled words in a very involved, focused state. They can effectively enhance their vocabulary acquisition abilities from the gaming experience.

4. Conclusions

Vocabulary is the foundation of a language and the core of learning and communication and language development is highly dependent on learners' vocabulary acquisition abilities (Carol, 2001). However, vocabulary acquisition is usually the most difficult part during the learning processes for most EFL learners. Therefore, it is imperative to construct a learning environment to make EFL learners have an engaged vocabulary learning experience to enhance their learning interests. Recently, digital

game-based learning suggests a new learning paradigm of learning by playing within visual and interesting environments. As a consequence, this study developed an online multiplayer English vocabulary learning board game, named *VocaMono*, for English vocabulary learning. Adapted from the famous games *Monopoly*, *Unscramble*, and *Scrabble*, this research developed *VacaMono* by effectively integrating the gameplay and pedagogy designs for vocabulary learning. *VocaMono* has been designed to have unique educational game characteristics that should be of interest to vocabulary learning. It enhances learners' motivation for learning and memorizing English vocabulary. By playing this educational game, players' are able to enhance their vocabulary acquisition abilities not only for correctly spelling taught vocabulary but also for discovering spelling patterns. This game can fit players' vocabulary levels by selecting words from the word scope. Furthermore, this game is possible to be used to correspond to the class progresses.

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