English Learning Motivation and Vocabulary Acquisition among Young Working Adults Who Play an Online Collectable Card Game

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Abstract: Though much criticism has been voiced about online games for being mindless entertainment, contemporary literature has supported the use of them in the educational context, for instance, second language acquisition. Yet limited literature has focused on the effects of playing games in leisure time on young working adults' informal learning. This research aims to assess the effects of playing an online collectable card game on young working adults' target vocabulary acquisition through a quasi-experimental research design, to investigate whether vocabulary acquisition is correlated to their learning motivation, and to further evaluate their views on playing games in English for language learning purposes through follow-up interviews. The results indicated that playing the online collectable card game contributed to statistically significant vocabulary gain, and that vocabulary gain might correlate to English learning motivation. Participants generally had positive feelings towards using the game as a tool to learn English vocabulary and reported "fun" and "interesting" as comments, though some concerns about the limitation of words in the game and the application of learning were expressed.

1. Introduction

Though much criticism has been voiced about online games for being mindless entertainment, contemporary literature has supported the use of them in the educational context, for instance, second language acquisition [1]. This mixed-method research is intended to investigate the effects of one genre of online games, i.e. collectable card game, on English vocabulary acquisition among young working adults, defined as individuals aged 18-30 who are currently in employment for the purpose of this study, and whether vocabulary acquisition is correlated to their learning motivation.

To date, a large volume of research has been conducted to study the use of games for educational purposes. However, the majority of studies were done in educational institutions, i.e. high schools or universities, and participants were high school students or university students [2] [3] [4] [5] [6] [7] [8] [9] [10] [11]. Yet limited literature has focused on the effects of playing games in leisure time on young working adults' informal learning, which is defined as "learning that happens away from classrooms, schools, [and] educational institutions" [12].

The research has implications for young adult game players who are looking forward to improving English vocabulary acquisition through playing games in their leisure time, and potentially for education researchers who are interested in carrying out rigorously designed larger-scale randomised control trial in this field.

2. Literature Review

2.1 Motivation as One of the Benefits of Using Games for Second Language

A large and growing volume of theoretical work has focused on explaining motivation factors behind game playing. One of the hugely influential theories in this field was proposed by Malone who suggested that challenge, fantasy, and curiosity are three major intrinsic motivators in games [13]. More recent theoretical framework indicated multiple factors such as "the player", "the game itself", "how the player interacts with the game", and "the context in which the game is played" contributing to motivation behind game playing [14].

Empirical studies have examined the possibility of transferring motivation associated with game playing into educational settings. For instance, [4] examined Iranian high school students' language learning motivation before and after playing video games and concluded that students' language learning motivation increases over time, implying that motivational engagement related to game playing could be transferred to educational settings. Furthermore, learners' perceptions towards using games in learning have also been examined. Reference [2] analysed questionnaire data from 222 Japanese university students and showed that they are "enthusiastic" (p. 403) about incorporating game playing into English learning and report "enjoyment" and "motivation" (p. 397) as benefits. However, it is worth pointing out that these studies relied mainly on self-reported data and may be geographically limited.

2.2 Relationship between Motivation and Second Language Acquisition

Considerable research has been conducted on the relationship between motivation and second language acquisition. Early study [15] identified motivation as a significant contributor to language achievement in addition to language aptitude. Reference [16] later developed the Attitude/Motivation Test Battery (AMTB) focusing on three attributes to language acquisition, namely "motivational intensity", "desire to learn the target language" and "attitudes toward learning the target language".

Contrary to expectations, empirical studies did not seem to confirm such a relationship between motivation and language acquisition. Reference [17] analysed 12 studies conducted in this field and stated that "only a minority of these studies found modest, positive relationships between some aspects of the integrative motive and L2 achievement". Nevertheless, a meta-analysis [18] was later performed to investigate the relationship among attitudes, motivation and second language achievement. Drawing data from studies including 75 independent samples and 10,489 individuals, it demonstrated that the correlation between achievement and motivation is the highest (0.39) among all factors. Therefore, it appears that an agreement has not been reached yet based on research findings.

2.3 Video Games and Second Language Vocabulary Acquisition

The Involvement Load Hypothesis for L2 vocabulary learning proposed by Hulstijn and Laufer [19] attributes vocabulary learning effectiveness to three dimensions of involvement load, namely need ("the motivational, non-cognitive dimension of involvement"), search ("the attempt to find the meaning of an unknown L2 word"), and evaluation (an act to "assess whether a word does or does not fit its context"). According to [20], certain video games when played strategically, can fulfil all three criteria of Hulstijn and Laufer's Involvement Load Hypothesis "in a manner that minimizes extraneous effort and stress on part of the learner, provides repeated interactive exposures to words, and automatically generates rich contexts for associations", and thus can provide affordance for effective vocabulary learning.

There is also a large volume of empirical research examining the role of video games on vocabulary acquisition. Reference [5] reported that freshman undergraduates who were assigned to the experimental group and played an English adventure game for five consecutive days demonstrate significantly better immediate receptive and delayed productive recall of target vocabulary than the control group, and that they also perceive playing video games as a useful method to learn a foreign language, especially for vocabulary learning. Based on [10], enhanced vocabulary recall might be attributed to interaction with in- game non-playing character (NPC) models. Their experimental research evaluated the effects of playing a commercial massive multiplayer online role-playing game (MMORPG) on ESL learners' vocabulary proficiency and demonstrated that vocabulary proficiency is associated with NPC model's appropriate use of vocabulary. Reference [21] examined the impact of game playing on English vocabulary acquisition among Taiwan college students and concluded that vocabulary acquisition occurs when students played the game alone as well as when they took notes while playing the game.

Together these studies provide valuable insights into the use of video games for language learning purposes. Nevertheless, the games used in many of these studies are action games including real-time strategy games, first-person shooter game [22], and massively multiplayer online games [9], etc. Limited research has been done on the effects of a more relaxing and slower-paced game genre, for instance, card games, on language learning. This study employs a readily available online collectable card game, Hearthstone, to aim to answer the following questions:

1) Does playing this game improve young working adults' English vocabulary acquisition?

2) Is there a correlation between English learning motivation and vocabulary acquisition among young working adults who play the collectable card game Hearthstone?

3) What are the participants' perceptions of using games to learn English?

3. Methods

A purposive sampling strategy was adopted to ensure seven participants recruited in the experiment group for the study met the following criteria: a) In the age range of 18-30; b) Native speakers of Mandarin; c) Have completed high school; d) Have played the Chinese version of Hearthstone and had at least 10 wins in the game and have not played the English version of the game. In comparison, seven participants in the control group met the selection criteria a, b, and c but they did not have Hearthstone game playing experience.

At the beginning of the research, all participants were invited to complete a vocabulary test, consisting of 30 vocabulary items chosen from the text on the card descriptions in the game Hearthstone based on their frequency of appearance and difficulty. Participants in the experimental group also completed the motivation questionnaire adapted from [23] and [24]. They were then asked to change the language setting of the game Hearthstone to English on their electronic devices, and to play the game in English for at least 5 days and at least 30 minutes each day during a 7-day period (in total at least 150 minutes of game-playing time). This game was selected for its popularity worldwide as well as in mainland China. Participants were also asked to send screenshots of each game win or lose to the researcher no later than the end of the 7-day period. After 7 days, all participants were invited to complete a vocabulary post-test, consisting the same vocabulary items as in the pre-test but in a randomized order. Participants in the experimental group were also asked to complete a questionnaire about their game-playing experience. Upon approval, they were invited for follow-up interviews.

4. Results

4.1 Game Playing and Young Working adults' English Vocabulary Acquisition

In terms of the two groups' pre-test scores, homogeneity was checked through the independent sample t-test, and equality of variances was confirmed through Levene's test (F=1.144, p>0.05). The results (Table 1) indicated that there were not any significant differences between the experimental group and the control group on the pre-test (t(12)=-1.044, p>0.05), suggesting that the two groups had equivalent English vocabulary proficiency prior to the intervention, and that any difference in the post-test cannot be due to the pre-existing difference in English vocabulary proficiency.

	Control (n=7)		Experimental(n=7)		F	р	t-value	df	р
	М	SD	М	SD					
Pre-test	3.14	3.29	5.86	6.04	1.144	0.306	1.044	12	0.317

Table 1 Homogeneity of The Two groups' Pre-Test Scores

An independent t-test was run to compare the post-test scores of the control and experimental groups. Analysis of the data (Table 2) revealed that the equality of variances could not be assumed by Levene's test (F=5.654, p<0.05), and that there was a statistically significant difference between the control (M=3.29, SD=3.40) and experimental (M=13.14, SD=8.53) group. The results indicated compared to the control group, the experimental group had significantly better vocabulary proficiency after the intervention. Additionally, a dependent t-test was run to compare the scores on

the pre-test and post-test in the experimental group. SPSS results (Table 3) indicated that the means of the experimental group's vocabulary test scores before and after the intervention were statistically different. Results from these two tests suggested a significant contribution of playing the card game to vocabulary acquisition among young working adults.

	Control (n=7)		Experimental (n=7)		F	р	t-value	df	р
	М	SD	М	SD					
Post-test	3.29	3.40	13.14	8.53	5.654	0.035	-2.84	7.86	0.022

Table 2 Independent t-Test Results for the Post-Test Scores

Table 3 Dependent t-Test Results for the Experimental group's Pre-Test and Post-Test Scores

Pre-test (n=7)		Post-test (n=7)		t-value	df	р
М	SD	М	SD			
5.86	6.04	13.14	8.53	-3.606	6	0.011

4.2 Correlation between English Learning Motivation and Vocabulary Acquisition

Motivation questionnaire items completed by the participants in the experimental group were coded or reversely coded depending on the positive and negative nature. The results showed that young working adults had varied levels of motivation towards English learning. Statistical analysis was performed to examine the relationship between their English learning motivation (M=43.71, SD=9.60) and vocabulary gain obtained from the post-test score minus the pre-test score (M=7.29, SD=5.35), and failed to indicate any significant correlation (r=0.635, p=0.126). It should be noted that one participant refused to complete the questionnaire regarding game playing experience and to be interviewed after the completion of the post-test for unknown reasons. If this person's data were to be omitted, then there would be a strong positive correlation (r=0.942, p<0.01) between young working adults' English learning motivation (M=41.83, SD=9.00) and vocabulary acquisition (M=7.83, SD=5.63).

4.3 Participants' Perceptions of Using Games to Learn English

All but one participant in the experimental group completed the questionnaire regarding their game playing experience after the intervention and the post-test. Individual interviews were conducted in order to supplement the questionnaire results. The same individual did not participate in the follow-up interview either. Among participants who agreed to be interviewed, all of them chose to use Mandarin Chinese as the interview language. Interviews were then translated into English and summarised in Table 4.

Interview Question	Participants' Responses		Correspondence to the Questionnaire		
The experience of playing	Positive (4):	Negative (2):	Item 2. I found playing the English		
the English version of	- Interesting and fun (3)	- Time-consuming to read	version of the game interesting.		
Hearthstone	- Not bad (1)	English (1)	- Agree (4)		
		- Dislike of English (1)	- Disagree (2)		
Actions taken when the	- Guessed the meaning by o	bserving the function of the	N/A		
participant encountered	card (3)				
unknown words	- Used a dictionary app (1)				
	- Used an online search engin	ne (1)			
	- Switched back to the Chine	ese version (1)			
Impediments to game	No (3):	Yes (3):	Item 8. I think playing the English version		
performance	- Quick adaptation to the	- Lost winnable games (2)	of the game impeded my game.		
	English version (1)	- Level dropped (1)	performance.		
	- Words are not that		- Disagree (3)		
	difficult (1)		- Agree (2)		
	- Do not care about the		- Strongly agree (1)		
	win rate (1)				
Usefulness of the game as a	Useful (4):	Limited (2):	Item 4 (reversely phrased). I think playing		
tool to learn English	- Increased familiarity to	- Only interested in the	the game in English had no effect on		
-	the English words (3)	game (1)	learning English words.		
	- Enhanced motivation (1)	- Did not know how to use	- Strongly disagree (1)		
		the words memorised (1)	- Disagree (3)		
			- Agree (2)		

Table 4 Summarised Interview Responses

5. Discussion

The findings mentioned above indicate significant vocabulary acquisition as a result of playing Hearthstone and are in alignment with [5] [10] [21], despite the game genres used being different. This can be justified by the fact that Hearthstone provides learners with an authentic context in which the meanings of unknown words can be inferred using available information. Additionally, participants reported that they could guess the meaning of unknown words on the card because they knew the function of it. In this process, they seem to form connections between the new information (i.e. unknown words) and known information (i.e. the function of the card). This process is known as elaborative rehearsal, which is effective in storing information into memory [25]. Furthermore, as indicated by [26] vocabulary acquisition is negatively influenced by anxiety. Therefore, game playing might contribute to vocabulary gain by providing an anxiety-free learning environment.

There seems to be a lack of large-scale quantitative research on adults' English learning motivation [27]. This research might provide a few insights into this area of research. Though the majority of young working adults in this study thought that English can help with a better salary in the future (4 out of 7 participants) and that speaking English will add to the social status (5 out of 7 participants), they had relatively low English learning motivation (M=43.71, compared to the highest possible score of 80). This contradicts the results of [27] in which adult learners showed high scores on the motivated learning behaviour scale. Perhaps the fact that the adult participants in their study were attending language courses might play a role in resulting in such a difference.

In general, the majority of participants reported positive perceptions on their experience playing the English version of the game Hearthstone and using it to learn English vocabulary, which triangulates experimental research findings. One major concern, though, was that half of the participants reported impediment of game performance due to the unfamiliarity of English words on card descriptions, which could adversely affect participants' game playing experience, and potentially lead to unfavourable answers on post-intervention questionnaire. It is worth pointing out that participants stated some concerns about the applicability of words learned in the game in the everyday scenario. Though this is not a major concern of this research project, it is necessary for further research to consider the applicability of vocabulary learned in the game. To enrich the learning experience, providing supplemental learning materials such as examples of these words in sentences that can be used in everyday communication and worksheets for practice could be helpful.

6. Conclusion

The results of this research indicated that playing Hearthstone contributed to statistically significant vocabulary gain, and that vocabulary gain might correlate to English learning motivation. Participants generally had positive feelings towards using the game as a tool to learn English vocabulary and reported "fun" and "interesting" as comments, though some concerns about the limitation of words in the game and the application of learning were expressed.

Current research findings suggest that young working adults who are playing online collectable card games may benefit from simply changing the language setting to English to enrich knowledge in English vocabulary. However, questions such as how playing the game can contribute to language learning, what the mechanisms are, and what learning strategies should be used in accompany with playing the game in order to benefit young adults' English learning are still left unanswered. Further research is needed to comprehensively examine the potentials of online collectable card games as a learning tool for adult English learning and to answer the previously mentioned questions.

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