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Gamifying the CREW: Effects of Collaborative Responsive Writing Using Gamification, in Interactive Web-based E-books, on L2 International Students' Motivation and Academic Vocabulary Achievement

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Gamifying the CREW: Collaborative Responsive Writing Using Gamification in Interactive Web-based E-books on L2 International Students' Motivation and Academic Vocabulary

by

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Dedications

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Definitions of Terms

Second Language Acquisition (SLA): It is the framework for the practice of academic discipline that all language teachers can employ (Dewaele & Ip, 2013). It is an evolving science review and research in modern language education (Takač, 2008).

English Language Learners (ELLs): Students who are in the process of learning English and whose first language (L1) is not English (National Council of Teachers of English [NCTE], 2006).

English as a Second Language (ESL): In a country where English is spoken as an official language, English as a second language refers to teaching or studying the English language (Dewaele & Ip, 2013).

Motivation: Is defined as "some kind of internal drive which pushes someone to do things in order to achieve something" (Thohir, 2017, p. 1). Motivation is a term that is used to define the success or the failure of any complex task (Dörnyei, 1998).

Computer-Assisted Language Learning (CALL): Students learn the language with computer technology in every context (Egbert, 2005). It may be any language; however, English as a second or foreign language is the subject of this review. Computer technologies include electronics and software, such as computers or any software such as word processors, which lets them work (Egbert, 2005).

Collaborative writing: Storch (2013) defined collaborative writing as "an activity where there is a shared and negotiated decision-making process and a shared responsibility for the

production of a single text" (p. 3). Collaborative writing is also defined as the writing procedures where students share and co-create ideas, work together, and help each other create their drafts (Fung, 2010). Collaborative responsive writing as an instructional activity that promotes interaction during the writing procedure has been progressively more employed in L2 classes (Li & Kim, 2016).

Gamification: Gamification is applying game mechanics in non-game related contexts (Deterding et al., 2011). Gamification's main objective is to increase participation and motivate users by using game elements such as points, leaderboards, and immediate feedback, among other things. According to Werbach and Hunter (2012), gamification's concept is new: game elements and game design techniques in non-game contexts. It is based on the gaming industry's success, social media, and decades of research in human psychology. Any task, assignment, process, or theoretical context can be gamified. Gamification is diverse and has various uses.

Game elements: The elements of the games, which make the game pleasing, fun, and enjoyable (Dichev et al., 2015).

Game mechanics: The parts of games which make the gaming experience engaging, such as leader boards and ranks (Dichev et al., 2015, p. 88).

Game-based learning (GBL): Game-based learning (GBL) explains an environment where game content and game play improve knowledge and skill acquisition and where game activities include problem-solving areas and challenges that provide players/learners with a sense of achievement (Kirriemuir & McFarlane, 2004).

Abstract

International students usually find it challenging to adapt to English academic vocabulary (Park, 2019). The literature is interspersed with the use of a variety of technologies and technological tools to augment the knowledge of language learners regarding English academic vocabulary (Flemban, 2018). However, in this dissertation, *interactive web-based e-books* and two strategies to teach English academic vocabulary (gamification and collaborative responsive writing) is employed. Gamification is applying game mechanics in non-game related contexts (Groh, 2012). This study investigated the impact of these two strategies on the participants' academic vocabulary achievement and motivation level. In so doing, interactive web-based e-books are used as the main platform to teach English academic vocabulary. The participants of this study were comprised of international students who were learning English at the college level in the United States. There were 45 participants. The participants were randomly assigned to two groups: one group learned English academic vocabulary with collaborative responsive writing (CREW) with the presence of gamification, and the other group was educated with the traditional classroom teaching methods. All participants were given an instructional material motivation survey after being exposed to the treatment Having collected the related data, a variety of statistical procedures were used to find out if there is a statistically significant difference between the two groups. MANOVA and ANOVA were used to find out if the material is motivational for the participants of the study. A pre-test and post-test were also used to collect the related data concerning the level of achievement of the participants. This analysis was used at the subcategory level of the ARCS model: attention, relevance, confidence, and satisfaction. The

results of this study enrich the pertinent literature regarding the use of interactive web-based e-books, the role of gamification, and collaborative responsive writing (CREW) in learning English academic vocabulary and the factors that contribute to the participants' motivation level.

Chapter One:

Introduction

Background of the Study

Learning vocabulary is key in learning the English language since vocabulary is the building blocks of English sentences (Chen & Chung, 2008). It is the element that connects all four skills: speaking, listening, reading, and writing (Wulanjani, 2016). Vocabulary learners should make use of efficient learning strategies to expand their lexicon and ability to speak English (Goundar, 2019). English language learners have different habits to learn English vocabulary and understand words through context during reading, but all of these styles do not invariably result in long-term retention (Arslan & Tanis, 2018; Song, 2006). One of the most critical aspects of learning a second language is learning and building vocabulary; it is a long and demanding task in learning the English language (Gu, 2018).

English language learners must use unfamiliar vocabulary during their language acquisition. For them to learn and retain new academic vocabulary, they should be involved in different task-based activities in the classroom, such as writing tasks, describing exercises, and conversations (Laufer & Hulstijn, 2001; Sadeghi & Sharifi, 2013). Students must obtain a sufficient number of vocabulary words and know how to use them precisely in order to effectively communicate in English.

As discussed above, vocabulary is vital in order for students to be successful. The importance of vocabulary in the academic success of international students prompted the researcher to conduct the present study. A rather new platform (interactive web-based e-books) with two known strategies (gamification and collaborative responsive writing) was used to convey the meaning of English academic vocabulary.

Gamification in Education

Gamification is the use of game mechanics in a non-game context to increase motivation and promote learning (Boudadi et al., 2020). Gamification is a way of incorporating games into the classroom, which Kapp (2012) defined as "using game-based mechanics, aesthetics, and game thinking to engage people, motivate action, promote learning, and solve problems" (p. 10).

Further, gamification is a method of motivation and encouragement used in the areas of education, learning, and evaluation (Urh et al., 2015). For education, gamification offers the potential for greater student engagement and motivation (Simões et al., 2013) in the classroom and in online settings. In recent years, gamification has become very popular because of its potential impact on user motivation and learning, (Simões et al., 2013), as motivation has been consistently linked with learning (Garone & Nesteriuk, 2019).

Collaborative Writing (CW)

Collaborative writing is the writing procedure where students share and co-create ideas, work together, and help each other through interactions with their peers (Fung, 2010). Collaborative writing as an instructional activity that promotes interaction during the writing procedure has been more progressively employed in L2 (Second Language Learners) classes (Li & Kim, 2016). Collaborative writing task refers to the process that allows participants to explore, discuss, cooperate, and develop learning capabilities by working in pairs (Dobao, 2012).

Technology and writing have been fused to provide an opportunity for learning, interact further, and allow students to cognitively develop in a collaborative way. With the advancement of technology, teaching methods, such as writing, has evolved with time as well (Heidar, 2016). Thus, it is vital to examine the use of collaborative writing to discover how it can be improved in the years to come, especially in the teaching and learning environment.

Multiple studies were conducted to measure the effect and development of collaborative writing and computer-supported collaborative writing on participants' performance and achievement (Dobao, 2012; Erkens et al., 2005; Li, 2015). Other studies were also conducted to examine technology usage with collaborative writing (Calvo et al., 2011; Hadjerrouit, 2014; Li, 2015). These studies have suggested that web tools could be used as a potentially powerful means to develop collaborative writing by drawing on the interactions of the participants through the history function in order to measure the value of using technology with collaborative writing tasks (Gress et al., 2010; Hadjerrouit, 2014; Li, 2015).

Responsive Writing is a writing task that assists learners to connect sentences into a paragraph and create a logical connection sequence between two or three paragraphs (Abbasian & Bafandeh, 2014). Writing could be the most challenging skill in teaching and learning since writing produces concrete records that allow numerous drafts of revision and consists of technical accuracy. Collaborative writing highlights the significance of interactions to solve problems in creating a text, since theories of L2 learning motivate the use of collaborative writing tasks (Alawaji, 2020).

Interactive E-book Environment

This is not the first study scrutinizing the impact of interactive web-based e-books on the participants' achievements when it comes to learning a language. In one study, Alsofyani (2019)

explored the use of metacognitive reading strategies via discussion and extensive collaborative learning in an interactive e-book environment. Flemban (2018) employed animated pedagogical agents to not only motivate the participants, but to also facilitate their vocabulary acquisition. To find out what the level of impact that animated pedagogical agents (APAs) have on vocabulary acquisition and motivational level of the participants, the researcher focused on the role and effect of APAs on the participants' perceptions and learning outcome.

Drobisz (2017) conducted a study to explore the impact of four different APAs on English language learners' situational interest, cognitive load, and reading comprehension in online reading tasks. This study also used APAs and an interactive e-book environment to explore their impact on the reading comprehension skills of language learners. However, in the current dissertation study, gamification and collaborative responsive writing is employed as two known strategies to foster vocabulary development in international students using interactive e-book environments.

Statement of the Problem

The problem faced by many English language learners is that, despite having studied all the simple and basic structures in English, they still have a limited repository of active vocabulary (Coxhead, 2000; Nation, 2001). This is mostly true with international students as they gravitate towards using their mother tongue rather than their second language, even in the English classroom settings. While focusing on academic vocabulary when learning the language, students will have a better chance to make this important vocabulary a part of their academic knowledge and that helps them improve and make their academic study more manageable (Coxhead, 2000). Most international students learn vocabulary passively due to numerous factors, such as these: 1) they understand the teacher's explanation for definition or meaning, pronunciation, grammatical functions, and spelling. In this setting, language learners have

nothing to do in the vocabulary learning part but only listen to their teacher. 2) Students only learn the primary meaning of vocabulary. Consequently, they disregard all other meaning and function of vocabulary words. 3) Students regularly obtain new vocabulary through new words from their textbooks in classroom lessons. For instance, learners may find a new word in a text or paragraph and ask for explanations. 4) English language learners (ELLs) often struggle with learning and understanding the vocabulary at the beginning of learning the English language. Learning vocabulary is considered one of the most critical challenges that learners will face during second language learning (Asgari & Mustapha, 2011).

International students mostly have issues using academic vocabulary or complicated words in other skills such as their academic writing and speaking. In other words, the weakness of international students stems from the paucity of knowledge in academic vocabulary. There are different ways to learn academic vocabulary. Traditionally speaking, international students learn academic vocabulary through flashcards, reading texts, and lists of words. Today, computers and video games are key in the everyday life of children and adults. Thus, it is important to investigate whether students learn academic vocabulary efficiently through games and gamification (two related but distinct concepts), and if so, how do they learn through games and gamification. This study concentrated on a specific vocabulary strategy for English language learners. Also, the role of gamification on learning academic vocabulary is investigated. To fill the gap, this dissertation intended to enrich the pertinent literature when it comes to learning English academic vocabulary through the use of interactive web-based e-books and using two strategies (gamification and collaborative responsive writing).

The Purpose of the Study

The purpose of this quantitative study was twofold: it primarily investigated how collaborative responsive writing, using interactive web-based e-books, can affect L2 international students' motivation and achievement in learning academic vocabulary.

Further, this study examined how adding gamification strategies to collaborative responsive writing, using interactive web-based e-books, may amplify L2 international students' motivation and achievement in learning academic vocabulary. The results of the MANOVA test suggested major factors contributing to an increase in motivation level and vocabulary achievement while learning via gamification and collaborative responsive writing.

Significance of the Study

Today, the interest in learning vocabulary is increasing at a higher rate. Therefore, several aids are being implemented to help learners on this endeavor—some of which are educational games. Research in English teaching and learning as a second language has been underestimating the uses of vocabulary in language studies. One of the effective methods is learning language through games to develop language skills in English language learners (Saha & Singh, 2016).

Academic vocabulary acquisition requires multiple exposures, and games offer such opportunities, while motivating and engaging students in deeper cognitive learning (Townsend, 2009). There is a myriad of ways to expose English language learners to academic vocabulary. Researchers have employed an array of technologies and technological tools to both enhance the level of motivation and increase learning gains of English language learners Augmented Reality (AR) flashcards (Khoshnevisan, 2020); interactive e-book environment (Alsofyani, 2019; Flemban, 2018); animated pedagogical agents (Drobisz, 2017); digital pedagogical agent (Nielen

et al., 2018); computer games (Smith et al., 2013); automatic writing evaluation (AWE) tools (Khoshnevisan, 2019); computer games and reading texts (Smith et al., 2011); IMapBook and games (Gill & Smith, 2013).

Drawing on the ARCS model, prior studies have investigated the modus operandi of how different technologies and technological tools may contribute to increasing the motivation level of the participants when learning English. Previous research has investigated the impact of engaging and collaborative environments on acquiring a new language (Cascales et al., 2013; Cheng & Tsai, 2014; Khoshnevisan, 2020; Wu et al., 2013). Also, multiple studies have investigated the impact of gamification in education and learning environments on the participants' level of motivation (Garone & Nesteriuk, 2019; Simões et al., 2013). This study can also serve as a catalyst for designing an ambiance conducive to learning English academic vocabulary for international students. The results of this study suggested that the best strategy to teach academic vocabulary is using interactive web-based e-books. It also informed the ways through which the motivation level of the participants can be increased in using interactive web-based e-books while learning English academic vocabulary.

Research Questions

This study is intended to help international students who are learning English in American universities. The purpose was to focus on both the academic achievement and motivational level of the participants. Ultimately, the impact of two different strategies (gamification and collaborative responsive writing), in interactive web-based e-books, on academic vocabulary achievement and motivation level of the participants is scrutinized. To this end, a quantitative research method to measure both the cognitive attainment and motivation level of the participants

while learning English academic vocabulary is employed. The following research questions is addressed:

1. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' motivation?
2. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' vocabulary achievement?

The current study had one experimental condition and one control condition. Also, there was one independent variable with levels of "interactive web-based e-book."

Research Hypotheses

To attend to the above-mentioned research questions, two pertinent hypotheses were developed based on the researcher's experiences and the related literature. Accordingly, the mentioned research questions pivoted around the following hypotheses:

1. L2 international students' motivation scores measured by instructional material motivation survey (IMMS) in the collaborative responsive writing using gamification group are significantly higher than the motivation scores of L2 international students in the classroom learning group.
2. L2 international students' vocabulary learning test scores measured by Vocabulary Level Test in the collaborative responsive writing using gamification group are significantly higher than the vocabulary learning test scores of L2 international students in the classroom learning group.

Organization of the Study

In Chapter One, an overview of the research background, the purpose of this dissertation, and the significance of this study is offered. The research questions that guided this study are put forth. In Chapter Two, an overview of gamification, collaborative responsive writing, interactive web-based e-books, interactionist second language acquisition (SLA) theory, and the ARCS model is provided. In Chapter Three, the methodology and research design of the current study, including the context in which this study was conducted, the participants who were recruited, the treatment that was used, the data collection procedure, and the methods employed to analyze them is presented.

Chapter Two:

Literature Review

To describe the importance of vocabulary in language learning, consider the presumption that without grammar, a little could be understood, but without vocabulary, nothing can be understood (Wilkins, 1972). Vocabulary refers to learning to recognize unfamiliar words in second language acquisition (Susanto, 2017a). Researchers addressed vocabulary as a vital element of language capability and delivers much of the foundation for how well novice learners communicate (Hasnine et al., 2020).

Various systems have been developed to support web-based and ubiquitous learning contexts as a result. Learning English can be fulfilled by memorizing and practicing a large number of vocabulary words and numerous grammatical structures. Learning vocabulary is key to English learning. Research in English teaching and learning as a second language has underestimated vocabulary sources in language studies (Gu, 2003). Appropriate learning strategies are required to learn a second language (Alharbi, 2019).

Several studies argued that effective learning strategies and proficiency in English language are positively related (Di Serio et al., 2013; Maeng & Lee, 2015; Setiyadi, 2016; Teng, 2015; Teng & Zhang, 2020). Mohammed (2016) claimed that the more learning techniques are used, learning a second language is more likely to increase in the classroom. English Language Learners (ELLs) have significantly less English vocabulary knowledge than the mastery they have of their native vocabulary (Laufer & Yano, 2001). ELLs should increase their vocabulary

experience in order to become successful in their academic accomplishments in English academic endeavors. Successful vocabulary learners should use efficient learning strategies to expand their vocabulary power and understanding of English (Min, 2013). ELLs have different learning styles and understanding from context during reading. Reading texts does not essentially result in long-term retention (Elmahdi & Hezam, 2020). Accordingly, employing an appropriate strategy such as gamification to learn English academic vocabulary for ELLs is key in their academic achievements. With the use of gamification, ELLs learn vocabulary at their own pace (Retherford, 2020).

Importance of Academic Vocabulary

One thing that students, teachers, material writers, and researchers can all agree upon is that learning vocabulary is an essential part of mastering a second language (Schmitt, 2008, p. 329). Academic vocabulary is "words that are not used in everyday conversation; these types of vocabulary words are used to explain a concept and are most often found in academic text" (Kurzweil Education, 2014, p. 1). ELLs are encountered with academic vocabulary both on and off campus. There is no escape in it and ELLs need to know academic vocabulary both passively and actively. ELLs can use these academic vocabularies for their speaking and writing. Also, they need to know academic vocabulary so that they recognize the words in their listening and reading. Despite having studied all the simple and basic English structures, many English learners still have limited vocabulary. ELLs are motivated to use their mother tongue in the English classroom due to their deficient English vocabulary. The small range of useful vocabulary limits learners' ability to express themselves clearly and correctly, especially in their academic writing. Contextual interpretation of English vocabulary in actual texts for ELLs is extraordinary.

Research on vocabulary learning has received considerable attention in recent years for many reasons. Learning English can be achieved by memorizing and practicing a number of vocabulary words and multiple grammatical structures (Chen & Chung, 2008). Research in English teaching and learning as a second language has been underestimating the sources of learning vocabulary through gaming in language studies (Ebrahimzadeh & Alavi, 2017). This study explains the role of gamification and collaborative responsive writing in learning vocabulary.

The following section focuses on the significant aspects of designing vocabulary activities to burgeon higher levels of motivation and achievement. The following theories undergird crafted vocabulary activities, and they will also be used for the treatment section of this dissertation. The application of the following theories is deemed to augment the motivation level and cognitive attainment of the participants' when learning academic vocabulary by two strategies (collaborative responsive writing and gamification).

Theoretical Framework

Technique Feature Analysis Theory (TFA)

The Technique Feature Analysis (TFA) is a theoretical framework that outlines five main components that a vocabulary activity must incorporate to be useful for learning vocabulary (Nation & Webb, 2011). The five elements are *motivation, noticing, retrieval*, *generation* (or creative use), and *retention*. The TFA components, summarized by Kamali et al. (2020), are as follows:

> Motivation refers to whether the vocabulary learning activity is motivating enough for learners to do. Noticing refers to learners' attention to and awareness of new vocabulary items to be acquired in addition to negotiation of target words. Retrieval

> refers to whether the vocabulary technique requires learners to recognize or recall the target lexical items as well as requiring multiple retrievals and spacing between each retrieval of the target word. Generation refers to the fact that words are met in new ways. (p. 6)

The factor of motivation posits that vocabulary activity has a clear learning goal and motivates learning. The noticing factor focuses on whether the activity gives attention to the target words, raises awareness of learning new words, and involves negotiation. It occurs when learners have to look up a word in a dictionary, deliberately study a word, guess from context, or have a word explained to them (Nation, 2001). The factor of retrieval consists of receptive and productive retrieval, involves recall rather than recognition, and whether there are multiple retrievals or spacing between each retrieval. According to Baddeley (1998), retrieval can be enhanced by repetition. The fourth factor, generation, can be divided into either receptive or productive processes (Nation, 2001). Receptive generation involves meeting a word while listening to or reading an unfamiliar context, whereas productive generation refers to using it in new contexts. The final factor, retention, mainly refers to whether a vocabulary activity ensures successful linking of form and meaning, whether it involves instantiation, imaging, and avoids interference.

The generation of the learning process in this learning system is achieved via two approaches: TFA utility and task diversity, the component "generation" comprises generative use, productive generation, and marked changes that involve the use of other words (Zou & Xie, 2018). Since receptive generation involves encountering a word through listening or reading unfamiliar words, this factor guided participants' first phase in learning the assigned vocabulary. In this dissertation, the productive generation factor guided participants' second phase in Creative REsponsive Writing (CREW interaction), which will be described in more detail later. Phase two

emphasized the component "generation" by asking learners to create, through writing, original contexts for the assigned vocabulary. In particular, the focus is further centered on part of the generation. Adding more social interaction has the potential to improve achievement and motivation in ELLs' academic vocabulary learning.

Interactionist SLA Theory

This traditional experience shows the positive impact of instructor-learner and the learner-learner interaction. Interactionist SLA theory offers an evaluative perspective for designing tasks and evaluating performance by providing hypotheses about what constitutes as meaningful interactions (Chapelle, 2005). This may be useful for theoretically framing collaborative responsive writing.

This theoretical model anticipates a great potential for language development when activities are designed with learners' interaction in mind. Chapelle (1997) hypothesized three types of interactions in SLA: interaction between people, interaction between person and computer, and interaction within the person's mind. For the purpose of this dissertation, one type was considered, which was the interaction between people. Chapelle (1997) applied research methods for SLA to Computer Assisted Language Learning (CALL), focusing on the interactionist approach and discourse analysis to investigate CALL activities. She emphasized observing learners' linguistic and nonlinguistic interactions in such activities, particularly those aspects of interactions that advance SLA.

In the vocabulary activities, the researcher focused on social interaction, in the form of a small social ecosystem, which might be stimulated by two related ideas: peer feedback and gamification. It is believed that these two ideas provided some approximation of a social ecosystem that can be used to amplify the learning effects of collaborative writing. When students post and

provide peer-feedback to each other in gamification-based environments, this can be considered a higher-quality peer-feedback than students in a traditional learning situation control group, as per evidence provided by Huang et al. (2019) for the positive effects of gamification on students' online interaction.

Peer feedback is significant in gamification (Indriasari et al., 2020). There is a lack of research on this particular factor. Furthermore, there is an urgent need for more systemic, quantitative studies comparing effects of collaborative writing with traditional strategies in a regular classroom setting, in terms of motivation and achievement, in academic vocabulary learning for international students.

Motivation

Motivation is a theoretical construct to assist in understanding why and how people learn something. While student motivation is an important variable in the educational field, it is most critical for learning a foreign language and second language (Anwaruddin, 2013; Cheng & Dőrnyei, 2007; Ushioda, 2011). Motivation is positively related to L2 achievement. Motivation supports successfully learning the target language (Masgoret & Gardner, 2003). This type of motivation is measured in the socio-educational model of L2 acquisition, the social context model, the motivation to communicate model, and the complete motivational framework (Gardner & Lalonde, 1985; Warschauer, 2004). A general form of motivation is relevant in any second language learning setting. It is not a characteristic, as some individuals challenge, but rather a general trait of the individual that affects any chance to learn the language. Researchers found that a high level of instrumental motivation in English is needed to graduate from tertiary education. Similarly, other authors found that college students lack integrative motivation (Dwaik & Shehadeh, 2010). Most of them respond negatively when asked about the desire to learn the foreign

culture. However, it is found that instrumental motivation is not significant enough to promote second language learning proficiency. Only a few students studying English are concerned to know the culture of the English language; hence, they have less interest in integrative motivation (Al-tamimi & Shuib, 2009).

Multiple studies have focused on motivation as an important factor for language learning (Akram & Ghani, 2013; Alizadeh, 2016; Ebrahimzadeh & Alavi, 2016; Oroujlou & Vahedi, 2011). The previous studies recognized two types of motivation: integrative and instrumental motivation. According to Samad et al. (2012), instrumental motivation is the urge or desire to acquire a second language for a given reason: getting a degree, traveling, or getting a job. Contrarily, integrative motivation involves knowing a second language. This knowledge familiarizes learners with the culture and the ability to communicate with people who can speak the target language. It is imperative to understand the importance of addressing tools of motivation for student learning. According to Warden and Lin's (2000) research, in Taiwan learners have instrumental motivation to learn English (Warden & Lin, 2000). It is because this subject is not their native language, and so, they hardly use it to communicate. Thus, the main reason for learning English is to pass exams to continue their careers. Instructors are advised to integrate educational games in language learning to promote learners' motivation and help them develop long-term studies (Ebrahimzadeh & Alavi, 2016).

ARCS Model

The use of the ARCS model can lead to more learning gains and increases learners' motivation levels. ARCS describes four categories for enhancing learners' motivation (attention, relevance, confidence, and satisfaction), Motivation and Performance is a working foundation and

frame of reference for the components of the ARCS model (Keller, 1979, 1987a). Furthermore, the model details the links and connections amongst the input, processes, and output.

Drawing on the ARCS model, a learner's *attention* must be gained in a lesson or practice to initiate the learning process. Keller (2000) noted that the strategies to gain a learner's attention range from unexpected events such as pictures, sounds, loud whistles, and the like, to encourage learners and users to advance a deeper understanding, especially at the beginning of a lesson or practice. Another significant element is variety. Variety is an important element to motivate students and to also sustain their level of attention. Learners need a change in the course of a lesson; otherwise, they would lose their interest. *Relevance* is the second category in the ARCS model. If this second requirement (relevance) is not built, motivation can be easily lost because learners do not find perceived value in the content. To build relevance, Keller (2000) suggested that instructional designers can link the content to the learners' future, including their jobs and academic success. Another way is to use stories, similes, and simulations germane to the learners' current interests and immediate experiences. The other required component to increase the motivation level in a learner is *confidence*. Keller (2000) highlighted that confidence is built only when students are helped to establish a positive expectancy to become successful. According to this category, a learner should attribute their success to the amount of effort and personal ability, rather than luck. If learners become interested in the content, motivation emerges in the learning environment. To sustain this level of motivation, the fourth requirement of the ARCS model (*satisfaction*) needs to be met. Keller (2000) posits that *satisfaction* means that students have been treated well all through a lesson. Additionally, satisfaction is relevant to the learners' success to cover their intrinsic motivation.

Keller (2000) noted that to make learners fully motivated all these four subcomponents of motivation must be taken into consideration. Keller (2000) introduces a matrix to embed a systematic motivational design in lessons:

> attention: Capture Interest (Perceptual Arousal): What can I do to capture their interest? Relevance: Relate to Goals (Goal Orientation): How can I best meet my learner's needs? Confidence: Success Expectations (Learning Requirements): How can I assist in building a positive expectation for success? Satisfaction: Intrinsic Satisfaction (Self-Reinforcement): How can I provide meaningful opportunities for learners to use their newly acquired knowledge/skill? (p. 4)

Games

In recent years, most educational games studies focused on K-12 students to examine the impact of these games and explore language educators and learners' perceptions about the educational tools used to learn vocabulary. Recent research findings informed us that CALL studies have some limitations such as a lack of in-depth communication, false observation, disturbed learning process, the burden of work, and educators' lack of computer knowledge (Garrett, 2009; Golonka et al., 2014; Warschauer, 2004). Multiple researchers have integrated games into learning English for a wide range of participants: Game Embedded CALL System (Young & Wang, 2014); Online Games (Muhanna, 2012); digital games (Van Eck, 2015).

Previous studies employed different strategies to facilitate the process of vocabulary acquisition by ELLs. In what follows, are pertinent studies that portray a rather comprehensive picture of the use of different strategies to teach vocabulary. Young and Wang (2014) conducted a study on "The Game Embedded CALL System to Facilitate English Vocabulary Acquisition and Pronunciation." The findings of this study revealed that there was a significant effect of the game

embedded call system. Muhanna (2012) conducted research on the impact of Online Games on vocabulary learning. The findings confirmed that using online games for vocabulary learning is more effective than traditional instruction as measured by the learners. Mehregan (2014) researched Game-Based Tasks for Foreign Language Instruction. The study examined the effect of language games on vocabulary learning among Iranian learners. Additionally, he investigated the likeness of the differences between male and female engagement concerning vocabulary learning in game-based tasks (Mehregan, 2014). The findings suggested a positive impact of game-based tasks on vocabulary learning.

Integrating digital games into learning has proven to remarkably benefit enhancing educational skills in language education (Van Eck, 2015). The games have improved learners' cognitive abilities by eliminating divided attention and improving spatial visualization. ELLs find games more motivating to acquire English vocabulary (Elaish et al., 2019). Games are vital to learning (Vasileiadou & Makrina, 2017). They motivate and encourage students through the provision of a fun platform that is a familiar environment. Moreover, when related to second language learning, it is a media that lowers the anxiety of second language learning, allowing for enough individual practice. The compelling reason for conducting the proposed study is that game-infused vocabulary learning has been found to have positive effects on vocabulary learning (Zhao, 2015).

Prior studies investigated different aspects of vocabulary game learning in other contexts. In the following Table, the most prominent research questions crafted and examined in the previous related studies to explore the gap are introduced.

Table 1. Research questions investigated in vocabulary learning through online games.

Authors	Title	Research Questions	Findings
Letchumanan & Hoon (2012)	Using Computer Games to Improve Secondary School Students' Vocabulary Acquisition in English	Q1: Does the integration of computer games expand ESL learners' vocabulary? Q2: What is the range of students' vocabulary based on their essays? Q3: What is the improvement in the vocabulary size between the learners' first and second essay? Q4: What is the preferred strategy for acquiring vocabulary among the learners? Q5: What are the reasons for students' strategy preferences in acquiring vocabulary?	The results show a significant difference between pre- and post-vocabulary tests. No significant difference was found between the two essays in terms of vocabulary richness.
Ashraf et al. (2014)	The Impact of Online Games on Learning English Vocabulary by Iranian (Low-intermediate) EFL Learners	Do online games significantly affect learning of English vocabulary by Iranian EFL learners?	The findings showed that the experimental group exceeded the control group statistically significant in the post-test. Therefore, online games proved to be more effective in learning English vocabulary for these students.
Sahrir & Yusri (2012)	Online Vocabulary Games for Teaching and Learning Arabic	Q1: What are the characteristics of a valid and practical Arabic vocabulary learning games prototype? Q2: To what extent will the implementation of online games learning improve learners' perception towards learning Arabic? Q3: To what extent does the implementation of on-line games improve learners' concentration, immersion and knowledge improvement in learning Arabic as perceived by the users? Q4: What are the strengths and weaknesses of the online Arabic vocabulary game as perceived by the users?	The findings indicate that students personally feel that they can learn Arabic vocabulary through online games. The evaluation process findings show that online games enhance learners' perceived perception, concentration, immersion, and knowledge improvement.

Games are inherently designed and crafted to be appealing to users. Accordingly, it is vital to reconsider and revisit game characteristics that increase the motivation level of users. This motivation can be used to bring about more learning on the students' side. Game characteristics have been extensively researched in the literature. Multiple researchers have examined the role of these characteristics in learning (Garris et al., 2002; Huang et al., 2019; Prensky, 2007). The following table presents different game characteristics researched by multiple researchers in the field.

Table 2. Game Characteristics

Authors	**Prensky (2007)**	**Huang & Johnson (2011)**
Classifications	joy, play, rules, goals, engaging, outcomes, and feedback, win states, /competition /limitations, problem solving, interaction, representation, and plot.	limitations, competition, rules and regulations, goals, fantasy and changed reality, plot of the story or representation, level of engagement and curiosity, role-playing, control, multimodality.

Technology and Language Education

The use of technology in the classroom is not a new topic. Previous research has focused on different language skills and subskills: computer games (Smith, 2012); digital pedagogical agent (Nielen et al., 2018); artificial intelligence and idiomaticity (Liontas, 2006); literacy and augmented reality (Park & Khoshnevisan, 2019); animated pedagogical agents (Drobisz, 2017); computer games and reading texts (Smith et al., 2011).

Research results imply that the present generation uses technology to a greater extent than previous generations (Beck & Wade 2006; Bolin & Westlund, 2008). The new generation is fond of technology (Solak & Cakır, 2015), several researchers have found the integration of technology

a useful tool for stimulating students' motivation in language education (Jamali et al., 2015; Khoshnevisan, 2020; Salmi et al., 2012; Solak & Cakır, 2015).

English learners might have different preconceived experiences, challenges, mastery, and interaction with educational vocabulary games and gamification. Many of them may not be familiar with them as instructional tools because they are not widely used in their countries, especially third world countries. Using these tools might burgeon some issues in the classroom for learners, teachers, and parents. However, educators might not be able to ignore these tools as they take the shape of language education in the foreseeable future.

Gamification in Second Language Acquisition

Mohammed (2016) noted that it is crucial to use a variety of techniques to help second language learners better acquire mastery of said language. Educational games are considered useful technological tools that motivate language learners and to also increase their knowledge of the contextual vocabulary of English as a foreign language and English as a second language. Educational games are the largest and most beneficial application categories (Garland, 2015).

Gamification represents the involvement of game designs to enhance student engagement and create a learning environment with a high level of motivation (Kim, 2015). In this sense, gamification can help the researcher and material developer to craft and develop motivational material that can culminate in higher cognitive attainment. Consistent with Kim (2015), using vocabulary activities embedded in gamification has the potential to engage students in the learning process and increase their motivation level while learning academic vocabulary.

Language educators have been working tirelessly to implement proper and effective teaching techniques to promote learning among students (Hwang & Wang, 2016). A study conducted in Malaysia indicated that over 95 percent of English language teachers preferred

videos, pictures, and projectors for teaching because they make lessons and teaching interesting. They facilitated keenness and participation among students (Yunus et al., 2013). Based on these results, gamification can be a working tool for learning in-classroom activities and even outside class. Language learning and vocabulary acquisition can be achieved through visual and audio aids (Gamlo, 2019). Aligned with these findings in the literature, it is deemed that gamification is an effective tool to convey the meaning of English academic vocabulary to international students.

There have been many studies on gamification in education. However, there has been few research studies investigating gamification in the language learning classroom. A study by Perry (2015) examined how gamification was used in a French university. This study used game models and game design methods in the form of quests and challenges from completing those quests. It was found that students generally approved of the gamified system and found it enjoyable. Some even described the gamification as motivating, which provides support for the use of gamification in second language learning contexts.

Additionally, gamification is a great reviewing tool for language learners because they can sustain students' motivation levels and increase their cognitive development through games (Kapp, 2012). This technique provides language learners with a unique opportunity that no other technological tool might be able to do so. It is also worth mentioning that every language educator needs to take the pulse of their class and examine their students to develop the best way to integrate games into his practices in and out of the class. It is also true that gamification gives more informality to language education. Hence, learners have the opportunity to practice a language in a less formal context. If effectively designed, gamification can supply language learners with an authentic context (Kapp, 2012). This is valuable, especially for students in a foreign language context where they do not have the opportunity to practice the language outside of classrooms.

Few studies investigated gamification (Hakulinen, & Auvinen, 2014; Hamari et al., 2014; Nah et al., 2014), with only the last one focusing on gamification in education. Iaremenko (2017) posits that "gamification helps to set flow by taking students out of their usual routine and giving them a series of engaging tasks that prevent students' minds from wandering and present a novel experience" (p. 128). Enhancing English for Academic Purposes (EAP) learning through gamification can have a positive impact on the students' learning process (Al-Hadithy & Ali, 2018). In this sense, students can learn English academic vocabulary through gamification because the pertinent literature indicates that it not only increases the motivation level, but it also increases the learning gains of the students. As discussed above, a study focusing on English academic vocabulary via gamification is apparently the gap in the literature. The results of this dissertation, thus, filled the gap and enrich the pertinent literature.

Games Elements in Education

Smith et al. (2013) noted that "educational gameplay and traditional study methods are made up of many different factors and components for instance, games provide built-in incentives" (p. 275). In education, the use of game elements is defined as any feature or mechanic commonly found in game (Deterding et al., 2011). Traditional design of patterns that design the games are also known as game elements (Flores, 2015). Some of these elements, sometimes described as components, are seen in most games nowadays, including points, badges, leaderboards, progress bars/progression charts, performance graphs, quests, levels, avatars, social elements, and rewards (Flores, 2015). All these elements have different purposes and can be adapted to any work, business, or education-related environment. Most of these elements can be adapted as gamification to course settings. Zichermann and Cunningham (2011) posits that "the game mechanics focuses

on seven primary elements: points, levels, leaderboard, badges, challenges/quests, onboarding, and engagement loops" (p. 36).

In an ESL context, language learners can use gamification to practice what they learn in an informal but authentic environment (Lam et al., 2018). Many of these online games afford users to play with people from around the world while cooperating to fulfill a mandate. This interaction is promising for a language education environment as it can scaffold language learning with the help of peers in a less-threatening atmosphere. Peer-correction is one of the critical features of this online gamification (James, 2016). Another important factor to take into account is motivation. One tool to increase learners' motivation is using a leaderboard in gamification and videos, or pictures in general.

Leaderboards are examples of social connections (Friedemann et al., 2015). In quests, students must work together to solve problems to earn points or other recognition. Leaderboards give information about where individuals are in connection with completing tasks. This social competition connects students to common challenges (Friedemann et al., 2015). Leaderboards allow students to view their progress with their peers (Hung, 2017). According to self-determination theory, for students who are given choices, the ability to determine their learning and create connections will be motivated. To socialize learning, the use of leaderboards gives students the opportunities to compete, showing progress as they complete tasks. This social interaction of competition creates connections with other students. Additionally, working on tasks or projects together to solve problems builds connections and connectedness. In a study by Landers and Landers (2014), the authors experimented with leaderboards to increase time on task. The authors used the leaderboards to show how those points were awarded to students to encourage them to spend more time with the course material, which they believed would increase learning

and motivation. The authors stated that "processes that could improve learning (such as increased time-on-task) must be identified, and those processes must be targeted by gamification interventions to affect learning indirectly" (Landers & Landers, 2014, p. 782).

The following table distilled several studies related to gamification in language education. As mentioned earlier, gamification has not been fully researched in the field of language education. It is thus important to review previous studies. The table showcases the studies including the title and the location where it was conducted.

Table 3. Studies applied Gamification in Language Learning in last five years

Author	Title	Location	Findings
Al-hadithy & Ali (2018)	Gamification in Learning English for Academic Purposes: Designing Assessment for Learning Using Kahoot with UAE Undergraduate Law Students	United Arab Emirates	The findings indicate that Kahoot- an online learning game- fosters students' intrinsic motivation. Furthermore, findings marked an increase in active learning, student engagement, self-directed learning, and improved outcomes.
Sun & Hsieh (2018)	Application of a Gamified Interactive Response System to Enhance the Intrinsic and Extrinsic Motivation, Student Engagement, and Attention of English Learners	Taiwan	The study integrated the gamification element with classroom teaching to make English classes attractive to learners. Overall, the study showed that the use of gamification leads to significant intrinsic motivation compared to using small whiteboards, which is more helpful for L2 when learning English.
Yavuz et al. (2020)	The effect of online gamification on EFL learners' writing anxiety levels: A process-based approach	Turkey	The results showed that the students who completed the activities had significantly lower anxiety levels than the students using the traditional way.

Table 3. (Continued)

Author	Title	Location	Findings
Kayımbaşıoğlu et al. (2016)	Integration of gamification technology in education	Turkey	Results showed that teaching language with a gamification context significantly improved language acquisition. Moreover, the observations show that technology-assisted learning also minimizes the distraction of the students and boosts the learning.

Collaborative Writing in Language Education

Collaborative writing (CW) has received considerable attention over the last decade with several approaches to its definition. Ede and Lunsford (1990), for example, listed three criteria that define collaborative writing: (a) the meaningful interaction during writing; (b) decision sharing for the written product, and (c) a single text as a product of collaborative writing. Storch (2013) defines collaborative writing as: "an activity where there is a shared and negotiated decision-making process and a shared responsibility for the production of a single text" (p. 3).

Vorobel & Kim (2017) concluded the approaches to collaborative writing, in a frame of ESL writing practices, as follows:

1. Students had a substantial, meaningful interaction with and assistance from other students at various stages of working on their writing assignments.

2. Students shared ideas, negotiated, and co-constructed them, and made corrections in each other's planning and writing at the peer review and other writing process stages.

3. The participants felt responsible for their peers' final written products. (p.79)

The writing practices in this study were bound by two longitudinal assignments' objectives, each lasting half a semester. Therefore, from the ecological perspective, they viewed them holistically, with each step in the writing process being important and interrelated with others.

A study conducted by Kessler et al. (2012) investigated how L2 students engage in the collaborative writing process using web-based tools for academic purposes to explore and understand the changing nature of collaborative writing. The study explored how students engage in collaborative writing using Google Docs. The study followed the mixed methods approach, and the participants were in a pre-academic orientation program at a large Midwestern university, the study included three sections of an English for academic Purposes (EAP) class. The participants worked in small groups of three to four members and the study lasted for three weeks. The study observed the writing process that student groups engaged in as they created their projects. The result showed that the participants focused on meaning over form.

Li and Kim (2016) investigated two ESL groups' interactions during two collaborative writing tasks that used a Wiki spaces tool in an English for Academic Purposes (EAP) course at an American university. The study examined the dynamics of peer interaction through writing tasks for each group. The results of this study indicated that for small group writing, Wikis are useful collaboration tools. However, the collaborative tools do not inherently motivate the participants to take a collaborative approach to writing.

Responsive Writing

Responsive writing reiterates a task that requires an assessment from the learners to perform at a limited discourse level. In this task, learners connect sentences into a meaningful paragraph and connected sequence of two or three paragraphs. Form-focused attention is mostly at the discourse level, and its emphasis is on meaning and context (Abbasian & Bafandeh, 2014).

Researchers have investigated the role of collaborative writing in language learning and teaching. The results have shown that collaborative writing can have a number of benefits, such as more opportunities for learning the target language (Storch & Aldosari, 2010).

Peer feedback and Collaborative Writing

Previous studies found that the traditional way of study is advantageous because it allows students to seek clarifications and involve their professors for further discussions (Yükseltürk, 2018). According to these studies, in classroom settings with a smaller teacher-student ratio, learners tend to enjoy the one-on-one contact with their professors or instructors through face-to-face interaction. In this environment, students and an instructor can participate in the discussion, with fewer possibilities of taking notes. Besides, the researchers claim that discussions create a ground where many topics can be covered within a short period. The only challenge with the traditional way of study is the time students discuss with their tutor may be the same time they are supposed to attend another class. The discussion may also involve a slower pace because some students are slow learners, and they spend most of the time seeking clarification. Multiple studies have been conducted in this domain (Elola, 2010; Harris, 1994; Hu, 2005; Storch, 2013). However, few studies have addressed learning academic vocabulary. It is thus imperative that future research takes this into account and conducts a study with academic vocabulary. Future studies need to include international students who are studying English in ESL contexts at either under or graduate levels.

Based on the collaborative writing approach, peer feedback is one of the stages in the collaborative writing process (Harris, 1994). The review of the previous studies included research where collaborative writing is framed as in Storch (2013) and studies on peer feedback.

Peer feedback is a collaborative activity involving students reading, critiquing, and providing feedback on each other's writing, both to secure immediate textual improvement and to develop, over time, more robust writing competence via mutual scaffolding (Zhu, 2001). The following table is intended to introduce some of the studies that has investigated collaborative writing and peer feedback in learning in different contexts:

Table 4. Studies investigated collaborative writing and peer feedback.

Study Title	Authors
Text-based peer–peer collaborative dialogue in a computer-mediated learning environment in the EFL context.	Zeng & Takatsuka (2009)
Investigating Writing Strategies and Revision Behavior in Collaborative Wiki Projects.	Kost (2011)
Collaborative writing: Fostering foreign language and writing conventions development.	Elola (2010)
Using peer review with Chinese ESL students' writers.	Hu (2005)

Rollinson's (2005), conducted a study of college level students of EFL in Spain and found peer feedback was effective with 80% of peer feedback comments considered valid and 65% acted on. Multiple researchers indicated that peer feedback helps learners in the real-world writing, encouraging them to the meaning-making process, and to raise students' awareness of their strengths and weaknesses as L2 writers (Liu & Sadler, 2003; Tsui & Ng, 2000; Tuzi, 2004).

Based on this literature review, there is a paucity of studies concerning international students. While the understanding of the role of gamification in language education is well developed, few research studies has been conducted to investigate the role of gamification and

collaborative writing tasks on the international students' English academic vocabulary development. Additionally, research results already corroborated the role of technologies on the students' motivation level (Khoshnevisan, 2020; Mivehch & Rajabion, 2020). However, this particular study, the motivation level of the participants who used interactive web-based gamification and implemented collaborative responsive writing tasks for their English academic vocabulary development is measured.

Collaborative writing in a traditional setting

Few studies scrutinized the traditional way of study and found it helpful because it allows students to seek clarifications and involve their professors for further discussions (Brodahl & Hansen, 2014; Lowry et al., 2004; Yükseltürk, 2018). According to these studies, in classroom settings with a smaller teacher-student ratio, learners tend to enjoy the one-on-one contact with their professors or instructors through face-to-face interaction. In this environment, students and an instructor can participate in the discussion, with fewer possibilities of taking notes. Besides, those researchers claim that discussions create a ground where many topics can be covered within a short period. The only challenge with the traditional way of study is that the time students discuss with their tutor may be the same time they are supposed to attend another class.

The discussion may also involve a slower pace because some students are slow learners, and they spend most of the time seeking clarification. Multiple studies have been conducted in this domain; however, few studies have addressed learning academic vocabulary. It is thus imperative that future research takes this into account and conducts a study with academic studies. Future studies need to include international students who are studying English in ESL contexts at either under or graduate levels.

International Students and Learning Second Language

Vocabulary learning is very important for students who want to build on their language skills. This is because every learner is bound to passively encounter vocabulary when reading and listening. They also need to use these vocabularies when writing and speaking in the English language. It is, therefore, very important for international students, who are learning English to find appropriate strategies to help them acquire a wide range of vocabulary to improve their academic record (Huang & Eslami, 2013).

Various methods have been used to achieve the objective of helping learners acquire vocabulary. According to Alghamdi & Ahmed (2018), some of the methods used are word-on-board and flashcard games, role-playing, the use of dictionaries, and blended learning. Anggraini et al. (2020) add to this list by suggesting collaborative writing as a method of teaching students who are learning English. Collaborative writing is the best method that educators can use to help international students acquire a wide range of vocabulary (Dobao, 2014). This method enables international students to acquire vocabulary faster. Students also learn from one another as they work together. Dobao (2014) noted that peer tutoring while learning vocabulary has a positive impact on the students' academic achievement.

According to Dobao (2014), learning is a socially situated activity. Students, therefore, learn better in groups than they do individually. This is what makes collaborative writing most effective in teaching vocabulary to international students. Students with the same language needs are brought together so they can learn from each other and grow their vocabulary knowledge together (Dobao, 2014). Collaborative writing entails having a group of students work individually on the same task before combining ideas to form one task (Ferlazzo, 2016). For instance, four students can draft an essay on English as a second language and then combine ideas from all

students to write one good essay on the same topic. According to Ferlazzo (2016), collaborative writing helps lower anxiety and increase confidence and motivation.

Collaborative writing enables international students to learn vocabulary by having students with varying abilities work on a common task (Anggraini et al., 2020). When learners work together in a group, they cannot have the same strengths and weaknesses (Dobao, 2014). Combining strengths and correcting weaknesses improves the competence of each participant in the group (Dobao, 2014). Various individuals also help pool ideas, and this helps boost learning (Chen & Yu, 2019). For instance, in a group of four, everyone can have a few unique vocabularies that they can share with the rest. By so doing, every member of the group has learned a few words by the time the task is completed. Combining vocabulary and other language skills results in improvement not only in vocabulary but also in their use.

Collaborative writing puts students in a collaborative dialogue which enables them to grow their skills in the English language. Collaborative dialogue is a form of dialogue speakers engage to achieve problem-solving and knowledge-building (Dobao, 2014). In the case of international students learning English as a second language, their common problem is understanding and communicating in English. Their common interest is to build their knowledge of English vocabulary so that they can write, talk, read, and listen more efficiently. When they engage in this kind of dialogue, they gain new knowledge as they use language as a tool to think and talk (Dobao, 2014). This dialogue improves the effectiveness of collaborative writing.

Learning English is not a simple task for international students, as they must acquire a wide range of vocabulary within a short period of time. However, using the right method to acquire vocabularies can help learners find it easier to improve their knowledge in English. Collaborative writing, which entices learners to engage in a collaborative dialogue, is very effective in helping

learners improve their vocabulary (Dobao, 2014). As discussed above, gamification and collaborative responsive writing are effective strategies to develop vocabulary by international students. Further, interactive web-based e-book systems have been proven to be effective tools in multiple studies. However, in this study, interactive web-based e-book systems in conjunction with gamification, will be used to both increase the motivation level and cognitive attainment of international students when learning English academic vocabulary.

The intention of this dissertation was to enrich the pertinent literature on learning English academic vocabulary, in interactive web-based e-books, using two experimental conditions/independent variables: (a) traditional classroom teaching methods and (b) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies.

Summary

Chapter Two addressed the main theories underlying this study. To this end, the chapter detailed gamification, collaborative responsive writing, interactive web-based e-book system, and the ARCS model. To delineate the role of motivation in the present study, the role of motivation in language education is explained. Further, the ARCS model, that was employed in this study to make sure that the material designed increased the motivation level of the participants in all subcategories (attention, relevance, confidence, and satisfaction), is detailed. The previous research regarding the ARCS model in education was illustrated to showcase how this was used. The ways in which games, gamification, and game elements were used in education is also discussed. Additionally, the importance of academic vocabulary for international students is presented. Finally, the importance of how gamification and collaborative responsive writing can facilitate the process of English academic vocabulary development is explored. Having presented the related literature, the gap in research, and how this current study addresses the breach in

research and enriches the literature is exposed. In the next section, the methodology that was employed to conduct this study including research questions, hypotheses, research design, research variables, setting, study participants, data collection, and data analysis is explained as well.

Chapter Three:

Methodology

Introduction

Chapter Three presents the methodology of the current study. To delineate the methodology of this dissertation, this chapter details how the research questions introduced in chapter one was addressed to investigate the effect of (a) traditional classroom teaching methods and (b) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies on the L2 international students' motivation level and academic vocabulary achievement.

Overview

This dissertation was an attempt to examine the effect of two different treatments (traditional classroom teaching methods and collaborative responsive writing, in interactive web-based e-books, with social gamification strategies) on the participant' motivation level and academic vocabulary achievement. To do so, the pre-tests and posttests are used to gauge the participants' academic vocabulary achievement. Additionally, the instructional material motivation survey (IMMS) is utilized to measure the participants' motivation level in two groups. Chapter one already presented the related research questions to be attended to via the research design detailed in this chapter.

Research Design

As already mentioned, a quantitative method design is conducive to burgeon the desired results in this experimental study. A quantitative research design is well defined by Leavy (2017):

> Quantitative research is characterized by deductive approaches to the research process aimed at proving, disproving, or lending credence to existing theories. This type of research involves measuring variables and testing relationships between variables in order to reveal patterns, correlations, or causal relationships. Researchers may employ linear methods of data collection and analysis that result in statistical data. The values underlying quantitative research include neutrality, objectivity, and the acquisition of a sizeable scope of knowledge (e.g., a statistical overview from a large sample). This approach is generally appropriate when your primary purpose is to explain or evaluate. (p. 9)

According to Leavy (2017), quantitative research design is one of the oldest forms of experimental research. The word 'experiment' in research is characterized as "taking a deliberate action followed by systematic observation" (Shadish et al., 2002, p. 2). Leavy (2017) stated the "as a research method in the social and behavioral sciences, experiments are systematic and controlled but still involve the basic protocol of creating a test to see if what you predict will happen, does happen" (p. 94).

Babbie (2013) noted that an experimental research relies on hypotheses. In other words, the role of the experiment is to either confirm or disconfirm the hypotheses. In this sense, the researcher recruits the participants, administer treatments, and measure if there is a statistically significant difference between groups.

To complete this study, the research questions are aligned with the research experimental approach anchored in causal logic. To test the validity of the hypotheses in this study, two research questions were developed. The first research question compares the two groups using traditional classroom teaching methods and collaborative responsive writing. This research question attends

to the effect of the first set of independent variables (traditional classroom teaching methods and collaborative responsive writing) on both dependent variables (academic vocabulary achievement and motivation level). The second research question examines the effect of the two strategies (gamification strategies and collaborative responsive writing) on the academic vocabulary achievement and motivation level of the participants. The second research question investigates the impact of the two independent variables (gamification strategies and traditional methodology) on the academic vocabulary achievement and motivation level of the participants.

Research Variables

This study encompasses both dependent and independent variables. Two different groups are compared: (a) traditional classroom teaching methods and (b) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies in the United States. The strategies that were employed in this study form independent variables of this study. Additionally, the participants' scores in instructional material motivation survey (IMMS) and academic vocabulary test shaped dependent variables of this study.

Independent Variable

As discussed earlier, two different strategies were used to teach English academic vocabulary in interactive web-based e-books. These strategies consisted of traditional classroom teaching methods, using pen and paper, and collaborative responsive writing, in interactive web-based e-books, with social gamification strategies. Different strategies were used to facilitate the learning process of understanding English academic words. These are different strategies used in previous studies and proved to be helpful for learning a second language. This study, however, is using different strategies with gamification at the core to facilitate language education. The strategies used are defined and compared as follows:

Table 5. Differences between experimental condition and the control condition.

Role-play inference game, Game-Based learning (GBL)	In the experimental condition, part way through the reading, students encountered a role-play inference game using text interaction, as shown in Figure 8. Here, students would click on buttons with words to answer questions posed by a simple 2D avatar. This did not occur in the control condition.
Peer feedback on Collaborative Writing	In the experimental condition, students provided peer feedback to other groups' collaborative writing. This did not occur in the control condition.
Leaderboard/Competition	In the experimental condition, students encountered leaderboards showing the top three achieving groups (the scores were based on peer ratings). This did not occur in the control condition. Students in the experimental condition knew, based on the study's introduction, that such a leaderboard would be encountered later.
Learning Modalities	The students in the experiment condition worked synchronously online with computers in a computer lab. Students in the control condition, worked with paper and pencil in a regular classroom.

Dependent Variables

The participants' scores in the vocabulary test and motivation survey are the major backbone of the dependent variables. The motivation level of the participants was measured by the Instructional Material Motivation Survey (IMMS). The motivation survey has four subcategories including attention, relevance, confidence, and satisfaction. Each of these subcategories have

different scores that together shaped the overall score of the students' motivation scores. A MANOVA and ANOVA were employed to analyze the scores. The improvement of the participants' performance was measured by a vocabulary pre-test and post-test. To analyze the motivation scores, a Two-Tailed Wilcoxon Signed Rank Test and ANOVA

Setting

This study took place at Tampa Language Center classrooms. Tampa Language Center is a private institution helping international students achieve admission to different universities at both graduate and undergraduate levels. Prior to conducting the study, the participants took a pre-test to make sure they are all at the same level of academic vocabulary knowledge. This ensured the homogeneity of the participants in the study. It also helped the researcher gain insight into the participants' prior knowledge to investigate the extent to which the participants acquire knowledge during the course of this study. This also lessened the confounding variables including differences in the participants' prior knowledge. They also took the demographic survey, so the researcher gained enough information about the participants' information to generalize the findings of this study to the general population. The actual components of the study were administered at the computer lab. The participants were randomly assigned into two groups. In one group, academic vocabulary was taught using gamification. In the second group, collaborative responsive writing was used to foster the participants' vocabulary knowledge. In the last group, traditional classroom teaching methods were used. The participants were exposed to different strategies including traditional classroom teaching methods, collaborative responsive writing, and gamification in three sessions. In other words, there were two already formed classes, each class were randomly assigned to be either a control or experimental group. The participants took the same pre-test, post-test, and IMMS.

Study Participants

English language learners at the university level were the participants in this study. Specifically, the participants were international students who are learning English as a Second Language (ESL) at the college level in the United States. The participants were students who were enrolled in English Language courses for learning English for academic purposes (EAP). All students were from an intermediate level in English proficiency, who already passed the International English Language Testing System (IELTS) test with a band score of 5 or higher.

Sampling

Students with intermediate English proficiency were included in order to obtain data relating academic vocabulary learning to a second language learner's proficiency level. 45 international students as the minimum number of participants were recruited due to the restrictions imposed by the COVID-19 pandemic. The determination of the sample size was supported by multiple factors. Steven (1996) noted that there are several factors that impact a researcher's decision about a convincing sample size including the effect size, desired power, tests, alpha level, and the number of variables in the data analysis procedure. The study was conducted with a 0.8 power, alpha level of 0.05, using G-power software. Based on the G-power software, the suitable number of participants for the study was 45. Thus, a total number of 45 students participated in this study. This was a convincing number of students based upon the average number of individuals used within prior studies. Each participant was randomly assigned to the two groups: (a) traditional classroom teaching methods and (b) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies. It is worth noting that the participants were equally divided between the two groups. There was a pre-test and a post-test for this study.

Group 1

Within an interactive web-based eBook, reading a text with new vocabulary words with glossed definitions, followed by a small group, collaborative responsive writing task using the new vocabulary items with gamification, i.e., rich peer feedback (short peer review comments and a rating of one to five stars, similar to movie reviews) and leader board.

Group 2

Control group, using printed material (VLT) and vocabulary activity includes matching term/pictures with definitions and flashcards. Further including reading a text with new vocabulary words, followed by a small group, collaborative responsive writing task using the new vocabulary items with paper and pencil. This group was not exposed to the technological tools such as gamification and interactive web-based eBooks. However, the content for both experimental and control groups were the same. The tests used before and after, the study, and the English academic vocabulary the students learned in both groups were the same.

To minimize contamination between groups, each group participating in this study consisted of a whole class, i.e., each group was one complete class. One group consists of 23 participants and other group was 22 participants.

Content of the Instructional Materials

The instructional materials of this research were crafted and tailored to facilitate the learning process of English academic vocabulary for the intermediate students. The material was designed aligned with the vocabulary level test (VLT). A total number of 20 vocabulary were randomly selected from the test. The content of lessons encompassed Matching game and flashcards. For the discussion section CREW, students read a text with new vocabulary words

glossed with definitions. The text was adapted from (e.g., the Schmitt & Schmitt Focus on Academic Vocabulary Book). Figure 1 showcases the material used in this study.

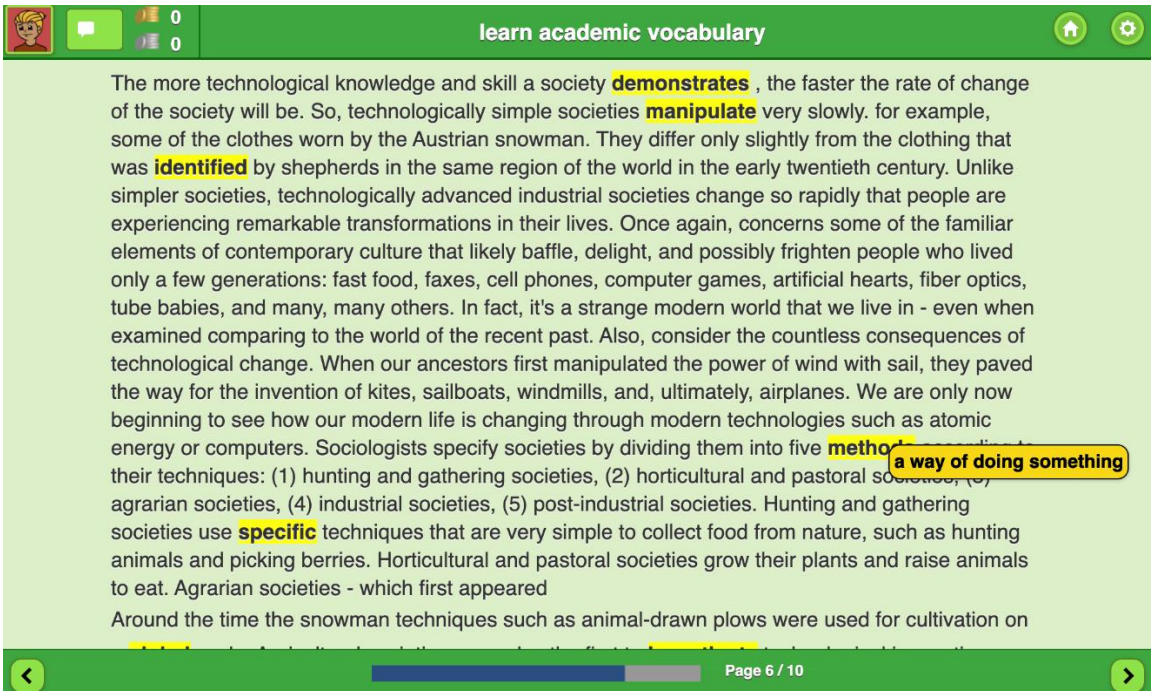

Figure 1. Content of the Instructional Materials

Instruments

Instructional Materials

The instructional materials in this dissertation detailed academic vocabulary lessons to international students for vocabulary activity. Students had a match game and flashcards. Next, the activities and how they are used in the current study is described.

Instructional Video

An instructional video was a good way to convey the information in a fast and visual manner. This video served as a catalyst to facilitate the process of taking the test and becoming familiar with the steps of and the modus operandi of working with the technology in this dissertation. The Cognitive Theory of Multimedia Learning developed by Mayer (2002) was

adopted for use in this study. The Cognitive Theory of Multimedia Learning (Mayer, 2002) details the main tenets of the learning process in a cognitive manner. The theory posits how to best facilitate the cognitive process of learning with multimedia. The three assumptions undergirding the theory are as follows: (1) it is assumed that for processing information two discrete channels, that is, auditory and visual channels are required; (2) the capacity of the channel is limited; and (3) there are different processes involved in learning including filtering, selecting, organizing, and integrating information. This multimedia instruction uses words and pictures as the main source of learning. The multimedia theory helped with how to plan the instructional video to further learn about the technology used in this dissertation. Figure 2 shows the screenshot of the instructional video designed for the participants of the present study.

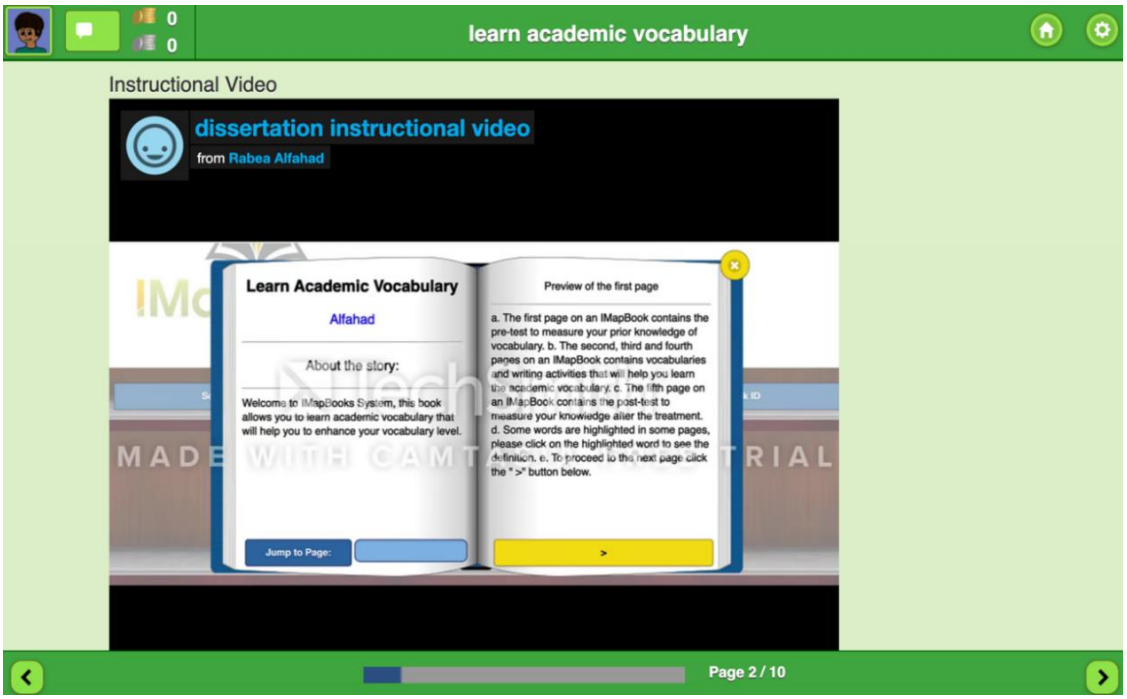

Figure 2. Instructional Video

Matching Game

The matching game improved and enhanced vocabulary mastery and vocabulary learning for students (Muslimin et al., 2017). This procedure was used to draw learners' attention so they could match the vocabulary with the definition and pictures. This practice was a good way to draw students' attention to the words. The objective was for learners to be able to recognize the word when they see pictures related to the meaning of each vocabulary term. The experimental groups were using the matching activity through the interactive web-based system, and they were exposed to printed materials to practice the same activity, but paper based. Figure 3 depicts the matching game used in this study.

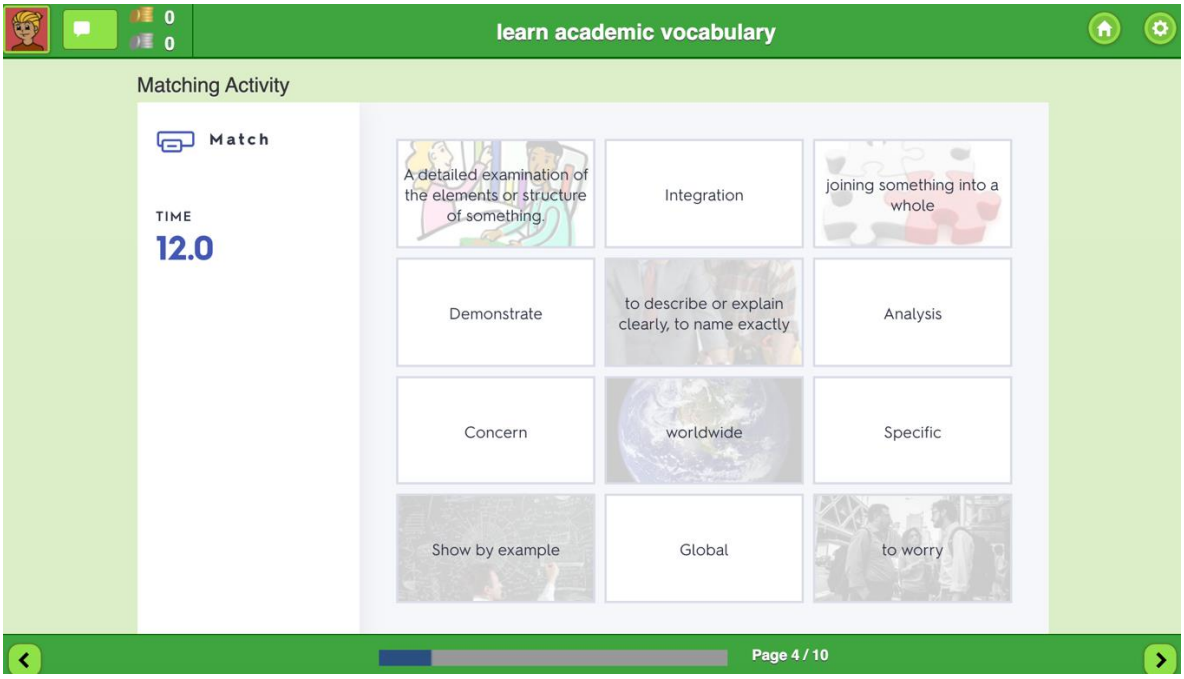

Figure 3. Matching Game

Flashcards

A flashcard consisted of a word, a sentence, or a simple picture and is widely used as a learning drill to aid memorization (Komachali & Khodareza, 2012). Khoshnevisan (2020) noted

that educators have extensively used flashcards to teach idioms and words. He used a new type of flashcards known as AR flashcards to teach idioms. In addition, the findings in his study revealed that flashcards (either traditional or AR flashcards) are useful and can facilitate the process of learning (Khoshnevisan, 2020). Chen and Chan (2019) noted that there are different types of flashcards. Traditional flashcards are printed ones that include different types of information to explain a word such as definitions and images. Another type of flashcards is known as visual or digital flashcards. These types of flashcards are commonly used on a computer or other devices. Researchers deem that this type of flashcards can facilitate the process of learning via double (audio and visual) channels (Ruwe et al., 2011). Lastly, AR flashcards are very useful for language learners. With this type of flashcards, a digital layer is superimposed on the printed flashcards so users can watch videos, listen to audio, and learn the language. Khoshnevisan (2020) speaks to the importance of this technology and the ways it can be integrated into the learning process. He also mentioned that AR flashcards can reach more students as they include multimodality.

The current study employed both printed and digital flashcards for the participants. The results of previous studies indicated that AR flashcards were motivational. In the current study, the experimental groups had digital flashcards in the vocabulary activity while the control group used printed flashcards with the vocabulary term and definition for the same activity.

Tools

In this study, a variety of tools were employed to collect the participants' information and data to assess their academic vocabulary achievement and motivation level. These instruments included: a demographic survey, an interactive web-based eBook system (IMapBook) with collaborative responsive writing and gamification options, a pre-test and a post-test to examine the students' vocabulary achievement—The Vocabulary Levels Test (VLT)—and motivation to learn

new academic vocabulary Instructional Materials Motivation Survey (IMMS). Each instrument is discussed below.

The Vocabulary Levels Test (VLT)

The Vocabulary Levels Test (VLT) for second language acquisition has been called the nearest thing to a standardized vocabulary test currently available (Meara, 1994, 1996). Ten years after the test was first developed, Norbert and Schmitt revised the Levels Test in Nation's book (Version A) and wrote three additional versions (Versions B, C, and D) using new collections of words for each level. The original specifications remained intact in the latest versions. Numerous research studies on vocabulary learning have used the tests as their instrument (e.g., Cobb, 1997; Laufer & Paribakht, 1998; Schmitt & Meara, 1997). Schmitt et al. (2001) undertook a similar test-development project with the four full forms of the test. They included 30 items instead of the original 18 by administering the tests to 106 non-native speaking British university students and creating two more extended versions. In the current study, the researcher used the new versions (VLT2) developed by Schmitt et al. (2001). Versions of this test are available for free on the Paul Nation personal website. The (VLT) is used to measure receptive vocabulary knowledge at the lexical level. The Vocabulary Levels Test uses word definition matching format to require test takers to match the vocabulary to the definitions. It measures knowledge of words at five levels: 2000, 3000, 5000, 10,000, and academic English words. Each level contains 30 items arranged in 10 clusters (Xing & Fulcher, 2007). The current study used the first and second versions of the academic vocabulary for the content of the vocabulary lesson, practice, and pre- and post-test to measure the results at the intermediate level. This test was completed in 15 to 60 minutes for all the levels. Therefore, for the two versions of the VLT academic vocabulary, the time will be 15 to 30 minutes. If the test was shortened, then the reliability will be lower (Susanto, 2017b).

Demographic Survey

The participants were asked about their demographic information. It was a multiple-choice survey, and it requested students to report their gender, age, native language, current English level in the institution, and preferred learning styles. Appendix A includes the demographic survey that was used prior to conducting the main study.

Motivation

Instructional material motivation survey (IMMS)

The participants were asked to complete an online questionnaire about the Instructional Materials Motivation Survey (Keller, 2010) based on the ARCS instructional design approach (Keller, 1987a, 1987b). As for the material design, the participants took an online questionnaire about their experiences with the vocabulary game. Descriptive statistics regarding the results of the online questionnaire were reported. This questionnaire indicated the extent to which the participants found the material motivational and interesting. For the motivation part and level of the participants using the vocabulary game, drawing on the ARCS Model, a MANOVA test was performed to find the significant differences in the participants' motivation level across different components of motivation, including attention, relevance, confidence, and satisfaction. Appendix B includes the IMMS that was used in this study. Figure 4 is the IMMS survey employed in this study.

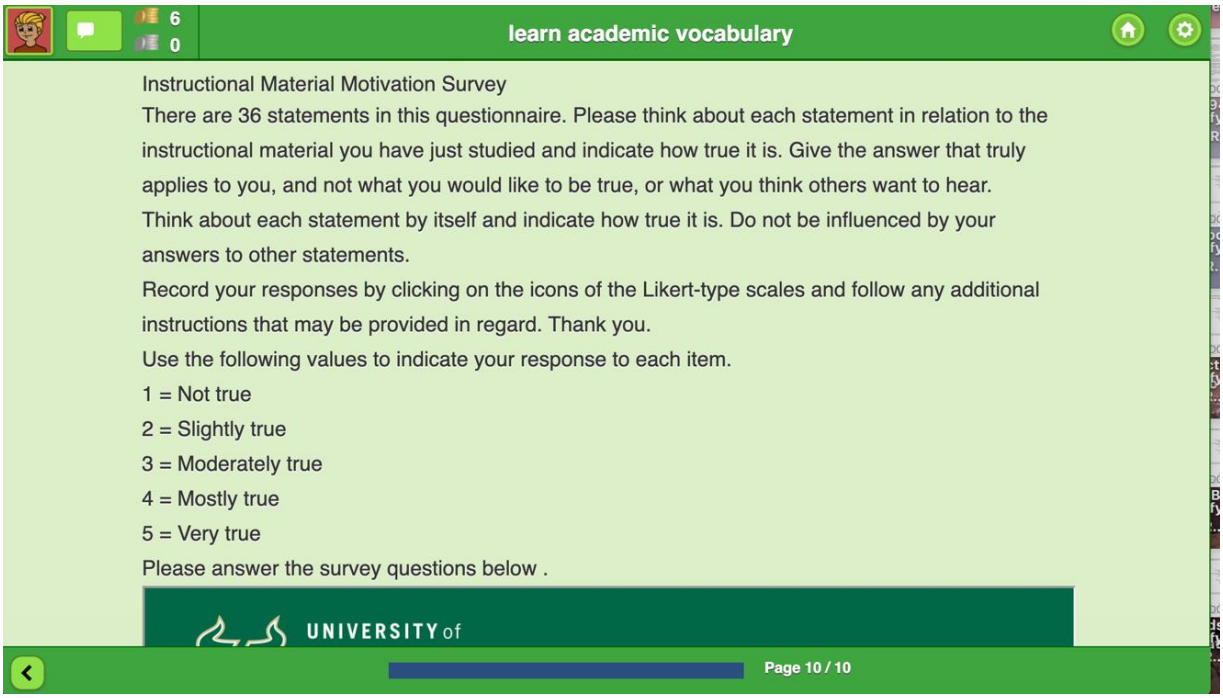

Figure 4. IMMS survey

Interactive web-based e-book system:

An interactive web-based e-book system, called IMapBook, was used for this study. Seven studies in five countries highlighted some of the advantages of these interactive eBooks, known as IMapBooks (Alsofyani, 2019; Drobisz, accepted; Jordan et al., 2018; Nielen et al., 2018; Smith et al., 2013; Smith et al., 2019). The content and design materials of the e-book all targeted English language learners. The content materials for the interactive vocabulary game e-book learning from the Vocabulary Levels Test (VLT). Paul Nation originally developed it in the 1980s (published in Nation, 1990), and subsequently revised by Schmitt, Schmitt, and Clapham in 2001. Figure 4 displays the IMapBook interface. Figure 5 shows the IMapBook, and Figure 6 displays the leader board used.

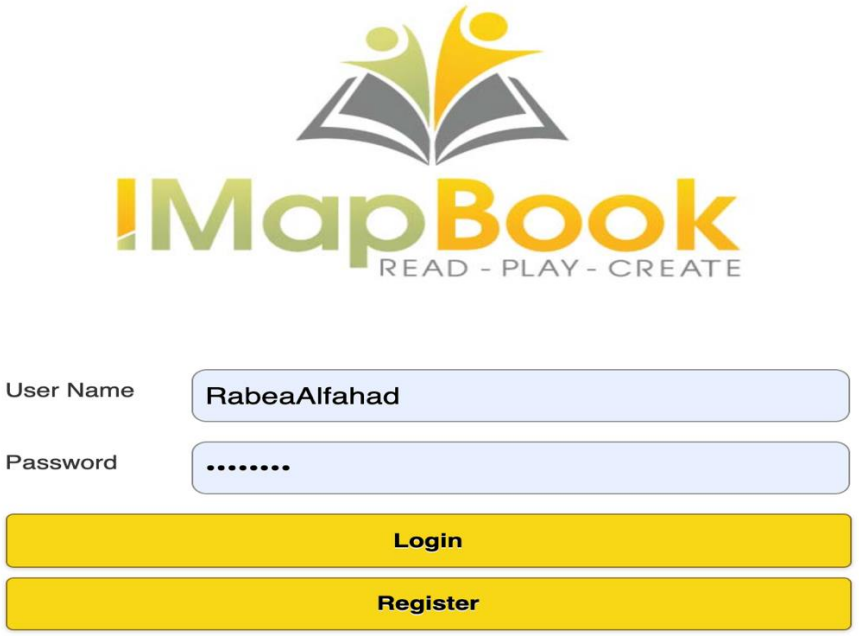

Figure 5. IMAP Book Interface

Figure 6. IMAP E-book

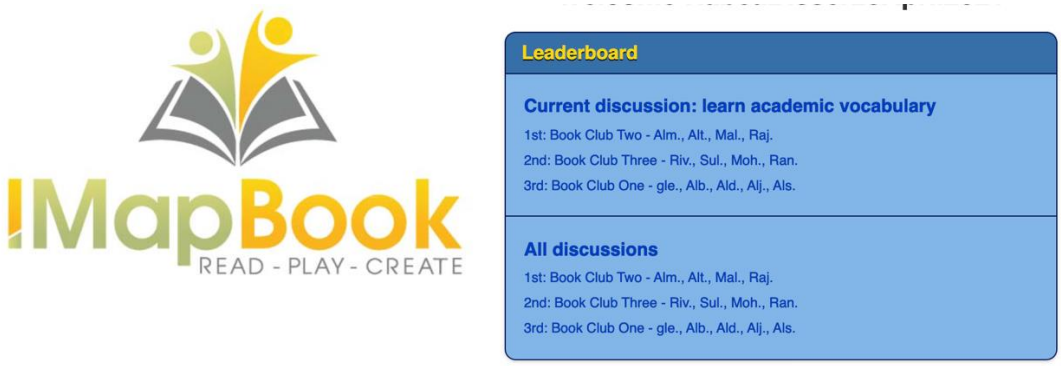

Figure 7. Leader Board

Traditional classroom teaching methods:

There is a myriad of methods to teach and learn English academic vocabulary discussed in the pertinent literature. On a closer scrutiny, it turns out that language educators do not have many specific ways to teach English academic vocabulary. Interviewing multiple language educators teaching EAP courses including English academic vocabulary, it appears that almost every classroom is engaged in learning academic vocabulary by memorizing lists of words, guessing words in context, and using flashcards. Accordingly, this study included a traditional classroom teaching methods group as a control group to be compared with the other two experimental groups. The students in this group learned English academic vocabulary through paper-based flashcards and matching the term with the definition. The flashcards included the meaning of words, definitions, and example sentences. This is commonly practiced in EAP courses, which constitutes the rationale of why this group was included in this study. This group was compared with other group learning strategies that are absent in English language classrooms.

Collaborative Responsive Writing (CREW):

The researcher of this study designed and developed web-based eBooks with games and social interaction suitable for researching online Collaborative REsponsive Writing (CREW) using the IMapBook system. In these interactive eBooks, students read a text with new vocabulary words glossed with definitions. Part way through the reading, students encounter a role-play inference game using text interaction (shown in Figure 8).

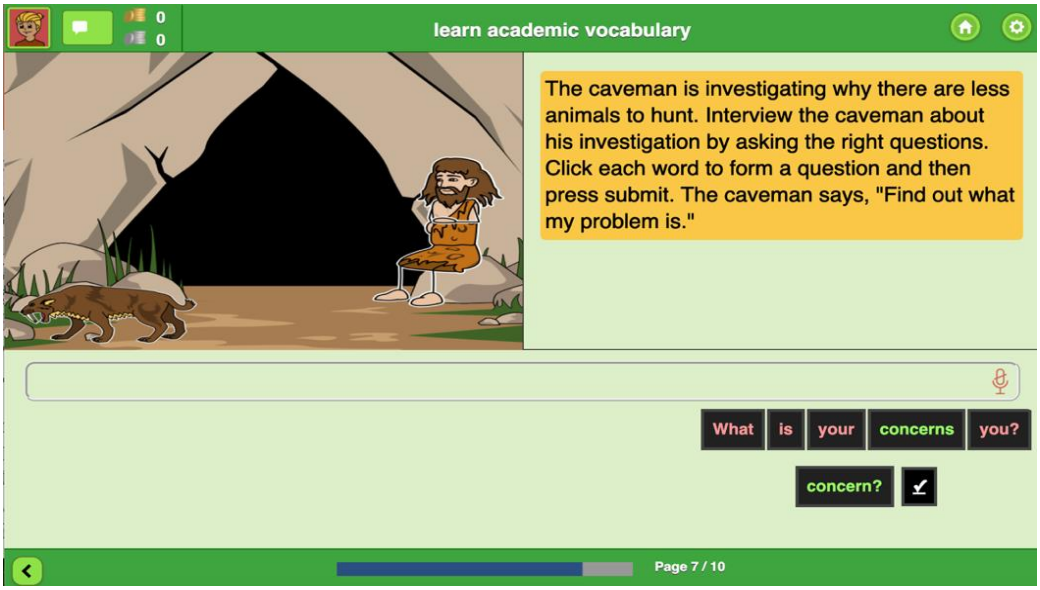

Figure 8. View from the role-play inference game.

In this exercise, students clicked on buttons with words (including new vocabulary words) to compose answers to questions posited by a simple 2D avatar (a caveman). If their answers include one of the new vocabulary words, and then match one from a set of correct answers (not shown to students), the caveman's face changes to a smiling expression. Thus, the student receives encouraging feedback, emphasizing why their answer is correct. If their answer does not match a correct answer, which is an inference made from the reading, the caveman assumes a frowning expression and the feedback then explains why their answer is not correct.

Students must answer several of these questions before they can continue to read the text pages. This simple activity was added to the intervention because it has been shown to improve ESL learners' knowledge of vocabulary, compared to traditional classroom techniques (Smith et al., 2013). This exercise works because it harnesses incidental vocabulary learning processes, such as making inferences from context and generative learning.

After finishing the role-play inference game, students read onward in the text pages until they encounter a pop-up informing them that a discussion awaited them (See Figure 8). The participants clicked on a talk balloon icon, and a CREW discussion, with a question about the text, opens up (See Figure 9). In the CREW, small groups of three to four students were formed that can text each other and were required to collaboratively write a response to the question which uses all of the academic words learned. Students in the other group also experienced gamification strategies to learn new academic vocabulary. The ratings were aggregated to compute the top two best responses in the class. The top team was listed on a leaderboard, and the top-rated CREW response was posted in a prominent spot.

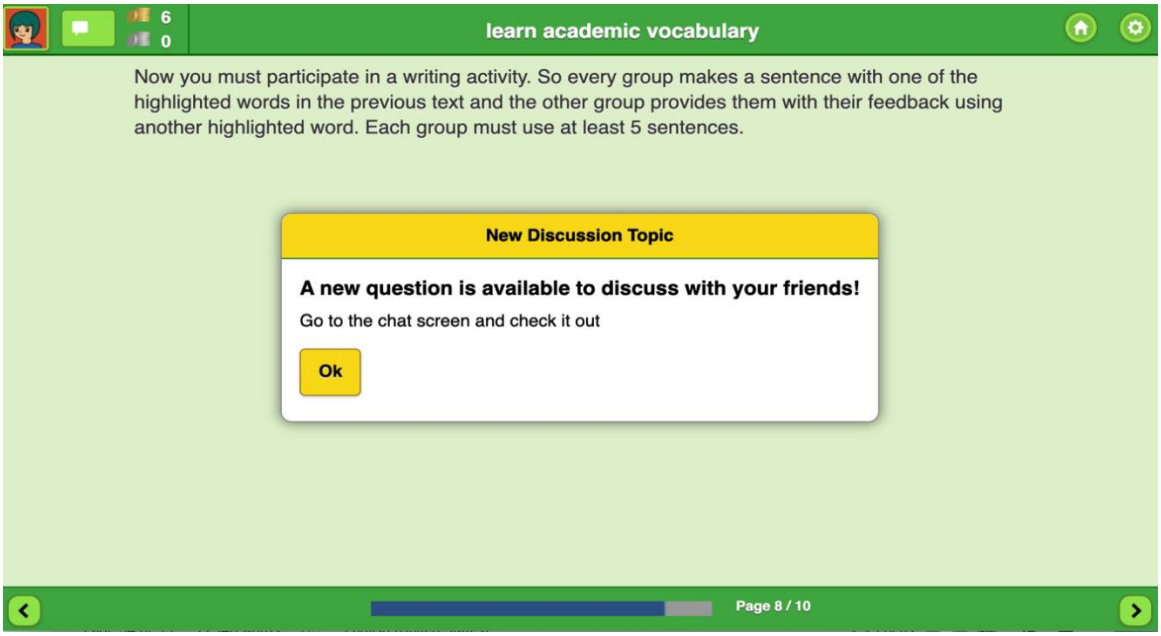

Figure 9. View from the eBook text page where the reader is informed of a discussion.

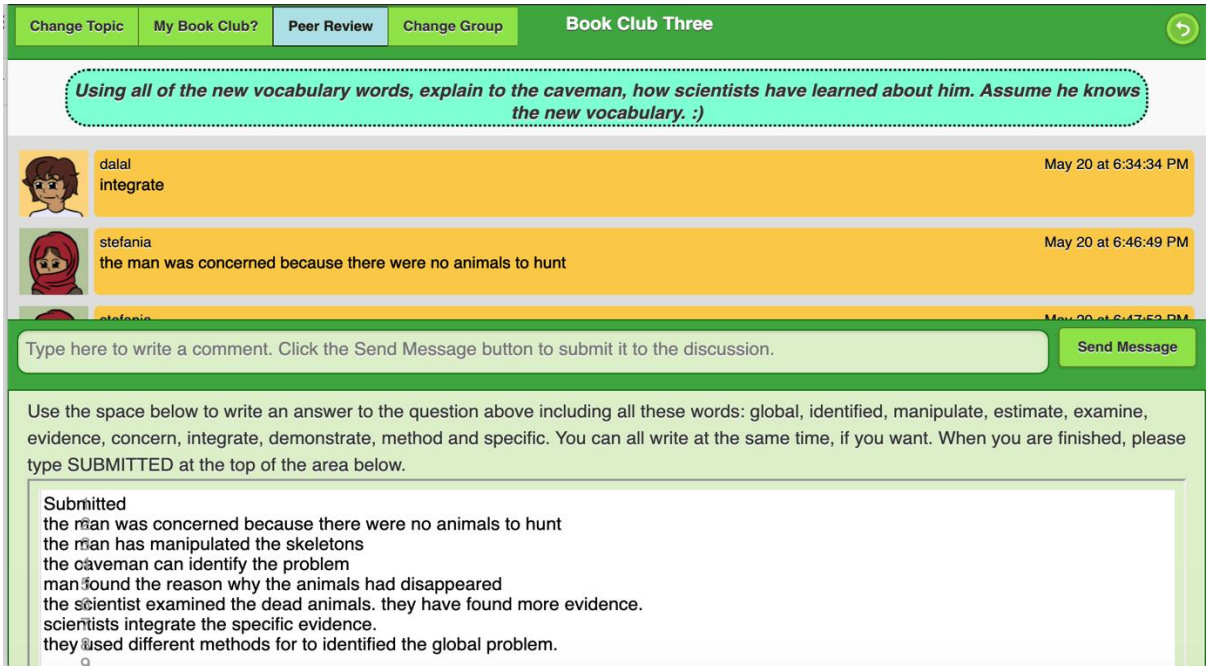

Figure 10. View of a CREW discussion

Data Collection Procedure

The participants in two groups took a vocabulary-based pre-test. This test is employed to assure the researcher of the participants' level of vocabulary knowledge. The pre-test collected data for comparing means of the groups in pre-test and post-test. In this sense, it was made sure that the academic vocabulary knowledge of the participants prior to the actual study is the same. Additionally, a simple comparison between the results of pre-tests amongst the groups corroborated that they were at the same level and there were no outliers in any of the groups. Figure 11 shows screenshots from pre- and post-tests.

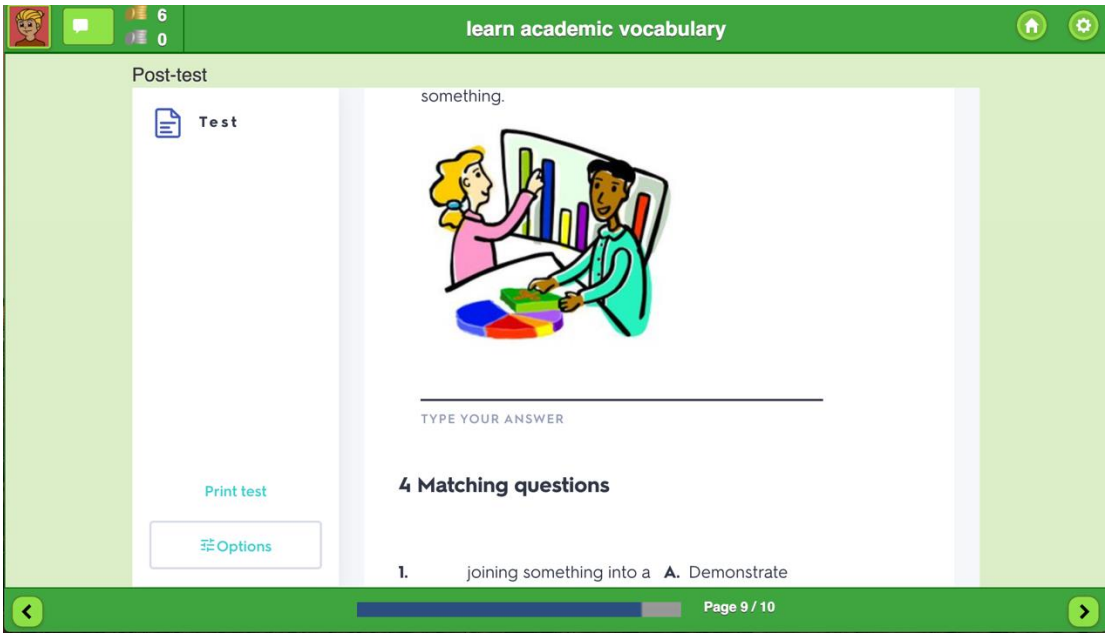

Figure 11. Pre- / post-test

To evaluate the participants' achievement in the two groups, (a) traditional classroom teaching methods and (c) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies, the participants were asked to take a vocabulary-based post-test. The difference between the pre- and post-test in vocabulary test indicates the participants' learning gains. Students were also asked to take an IMMS test to measure their motivation level after working with the system. This test measured the participants' motivation level at four different subcomponents: attention, relevance, confidence, and satisfaction. The results of the MANOVA test suggested the general difference between the groups and indicated the difference at the subcomponents levels, too. Consistent with prior studies of the role of IMMS in language education, the results of this study informed both language teachers and material designers on how to effectively design and exploit appropriate material to enhance the impact of educational technology in the field of language education. The results of this section of the study can either confirm or contradict the results of prior studies about the role of gamification and collaborative responsive writing in developing academic vocabulary knowledge of international students.

Pilot Study

Prior to the main study, the researcher conducted a pilot-study to initially test the interactive web-based e-book (IMapBook). The researcher developed a 15-item pre-test to investigate the vocabulary level of the participants prior to entering into this pilot study. The same items and pictures were used for the post-test but in a different order. Texts from the 'focus on vocabulary book' were also used. Texts are all adopted from the book with the words embedded so the students can guess the words in context. Also, the researcher designed vocabulary matching, reading texts, collaborative responsive writing, and inferencing games so students can practice their English academic words.

It was a way to make sure that the interactive web-based e-books work properly. The researcher intended to explore the perceptions and experiences of the participants about the interactive web-based e-book. The perceptions ranged from the interface of the interactive web-based e-books to the content (vocabulary and texts). The researcher aimed to explore the perceptions and experiences of international students about academic vocabulary and texts where the vocabulary was embedded. Additionally, the researcher examined if the activities were helpful for the participants to learn the academic vocabulary. The development of activities was the most significant portion of this pilot-study because it served as a catalyst for the international students to primarily guess the meaning of the academic vocabulary and then learn this vocabulary term. Ultimately, through the activities, the participants should be able to use the academic vocabulary in context. That is the ultimate goal of this study. Given the importance of academic vocabulary, the participants (international students) need to initially identify academic vocabulary and ultimately use them in context in either oral or written format. It is thus evident that the pilot test

was supposed to test if the treatment (including matching items, reading text and inference game) could successfully facilitate the process of language education.

Another important aspect of this pilot-study was the pre-test, post-test, and motivation survey. Having conducted the pilot study with six international students, the researcher found that international students at this level had no issue with understanding the items. Accordingly, both the pre- and post-tests were comprehensible to them. Also, the items in the motivation survey were easy for the participants to understand. The results of the tests and the informal chats after the tests suggested that these tests imposed no difficulty in the process of conducting the main study with international students with current English proficiency level.

In terms of the interface, all of the participants found the interface user-friendly and easy to follow. They mentioned that they had no issue with navigating through pages and following the instructions. The only issue was that the participants could not fully understand the instructions and they asked for more clarification. Thus, it was decided to modify the instructions and make them easier for the participants in this study. It was also decided to make an instructional video prior to conducting the actual study so the students do not have to read the instructions and can learn how to navigate in the system by watching a simple video. Another issue that the participants were dealing with was how to work and interact with one another in the collaborative responsive writing (CREW). This was a novel concept for the participants, and they needed to be provided with more of an explanation, so they are able to participate in the collaborative responsive writing (CREW). This contributed to understanding that the international students do not have the experience with certain drills, and they need to be explained prior to conducting the main study.

Data Analysis

For this experimental study, the researcher used a series of statistical tests to analyze the data. To evaluate the responses to the motivation instrument, the researcher used MANOVA, tests to measure the motivation level of the participants after participating in this study using different strategies: (a) traditional classroom teaching method, (b) collaborative responsive writing, in interactive web-based e-books, with social gamification strategies. If there was a statistically significant difference among the two groups, it was suggested that the treatments used made a difference in the motivation.

To assess the difference between the control and experimental groups in terms of vocabulary achievement gains, Two-Tailed Wilcoxon Signed Rank Test and ANOVA was used. These tests were used to examine whether there was a statistically significant difference between the two following groups: (a) traditional classroom teaching method, (b) collaborative responsive writing, in interactive web-based e-books, strategies—to learn academic vocabulary. The test measures the motivation level of the two groups and the potential differences among them.

Reliability & validity (IMMS - VLT)

The reliability and validity of IMMS were already examined. Keller (2010) notes that IMMS has already been administered to 90 participants at a major US Southern university. The internal consistency of this survey, according to Cronbach's alpha calculated statistics, was satisfactory (refer to Table 6).

Table 6. IMMS Reliability Estimates

Scale	Reliability Estimate (Cronbach's Alpha)
Attention	.85
Relevance	.87
Confidence	.81
Satisfaction	.82
Total scale	.91

(Keller, 2010)

The VLT test has been checked and examined by experts (Gyllstad, 2007; Teng, 2015). The VLT is a reliable and validated test (Nation, 2001). Multiple studies have reported the reliability of the VLT test (Liu & Zhang, 2018; Susanto, 2017b). As the measurement of VLT correlates with the level of reading comprehension, it is used to assess the reading texts chosen for students. It is the teachers' initial input about the status of their students' abilities before their lessons (Webb & Sasao, 2013). The present study took the reliability of the IMMS survey into account. To do so, the researcher used a single-test reliability analysis for the four levels of the IMMS survey (attention, relevance, confidence, & satisfaction). The result of these test will be discussed in the result section of this study.

Study Procedure

This section provides a thorough detail of the study procedure used for this dissertation. From the outset, the participants were briefed about the confidentiality of the study. They were informed that they may leave the study in case they are reluctant to continue. The tests and the aims of this study were explained to the participants. They were informed on how they may be

benefited by participating in the study. The participants then took a demographic survey to be reported in the researcher's final defense session. It included the participants' general information including their level of education, sex, age, and the like. Then, the participants segued into taking a pre-test. By giving the pre-test, the researcher made sure that the participants' prior vocabulary knowledge is at the same level. If there was an outlier, they were deleted them from the study. A total number of 45 participants were randomly assigned to two groups: (a) traditional classroom teaching method, (b) collaborative responsive writing, in interactive web-based e-books, the participants in each group were exposed to different treatments for one session. At the end, the participants took a post-test to measure their academic vocabulary achievement. The researcher used a variety of statistical procedures to find out if there is a statistically significant difference between the groups. A MANOVA and ANOVA were employed to find out if the material is motivational for the participants of the study. Also, several other tests—Two-Tailed Wilcoxon Signed Rank Test and ANOVA—were utilized to examine the likely achievement of the participant.

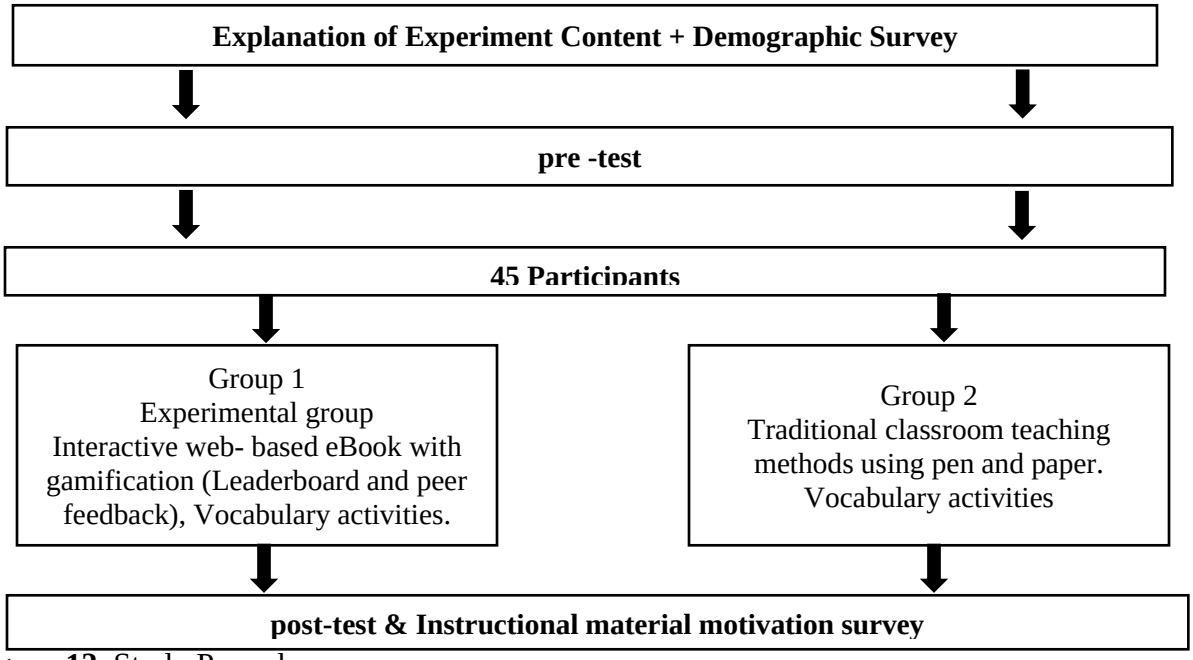

Figure 12. Study Procedure

Privacy and Ethical Consideration

Due to the federal and state agencies and programs for assuring research integrity, permission for conducting this research was required. This necessary approval was granted by the Institutional Review Board (IRB) from the University of South Florida. Only students who agreed to be part of this study participated. Each participant was informed of the study's objectives and signed consent forms prior to participation. They were informed that at any phase in this study, they were allowed to withdraw. The study was conducted anonymously.

Chapter Four:

Results

Chapter Four presents the findings pertinent to the research questions put forth in Chapter Three. The purpose of the present study was twofold: it scrutinized how collaborative responsive writing, in interactive web-based e-books, can impact L2 international students' motivation level and learning gains in learning academic vocabulary. Secondly, it sought to examine the impact of collaborative responsive writing employing gamification, in interactive web-based e-books, on L2 international students' achievement. This chapter presents the results of the data analyses and discusses the pertinent works in the literature. The results and the discussion of the current study hinges upon the following research questions:

1. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' motivation?
2. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' vocabulary achievement?

The aforementioned research questions burgeoned the following hypotheses:

1. L2 international students' motivation scores measured by IMMS in the collaborative responsive writing using gamification group are significantly higher than the motivation scores of L2 international students in the classroom learning group.

2. L2 international students' vocabulary learning test scores measured by Vocabulary Level Test in the collaborative responsive writing using gamification group are significantly higher than the vocabulary learning test scores of L2 international students in the classroom learning group.

The data was quantitatively analyzed to address research questions one and two. In this chapter, the demographic information of the participants is presented. The results of research questions one and two are elucidated. A discussion considering the pertinent literature and the related works is also presented. Finally, the chapter concludes with a succinct conclusion of both results and discussion.

Demographic Information

The background information ran in this study was used to obtain basic information about the participants of the study. A variety of information including the participants' age, nationality, TOEFL/ILETS score, and the number of years of studying English was collected. The total number of participants were 45. The age range of the participants was between 22 and 27. A number of 20 (44%) of the participants were male and 25 (56%) of them were female. Most of the participants had studied English for over a decade. Prior to conducting this study, all of the participants had the opportunity of studying English in an ESL context (United States).

Research Design

This study was an attempt to examine the influence of collaborative responsive writing and gamification on L2 international students' motivation. Concerning the research design used in this study, Table 14 depicts the first research question, the number of participants, data source, analysis procedure, and the likely outcomes concerning the first research question.

Table 7. Relationship between Research Question 1, Participants, Data Sources, Analysis Procedures, and the Expected Outcome.

Research Question	Participants	Number of Participants	Data Source	Analysis Procedures	Expected Outcomes
What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' motivation?	Control & experimental groups	45	IMMS survey	• Correlation coefficient • MANOVA • ANOVA	Gamification increases the participants' motivation level

Regarding the research design utilized in this study, Table 15 details the second research question, the number of participants, data source, analysis procedure, and the likely outcomes concerning the first research question.

Table 8. Relationship between research question 2, participants, data sources, analysis procedures, and the expected outcome.

Research Question	Participants	Number of Participants	Data Source	Analysis Procedures	Expected Outcomes
What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' vocabulary achievement?	Control & experimental groups	45	Pre/post tests	• Two-Tailed Wilcoxon Signed Rank Test • *Mann-Whitney U Test*	Gamification increases the participants' vocabulary achievements

Research Question 1

What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' motivation?

Results of The Reliability Test for IMMS Instrument

In the present study the researcher conducted reliability tests to assess appropriateness of the motivation measure. The average scores for each subscales are as follows: Attention M = 44.652, SD = 13.013 (Control group) M= 47.955, SD = 6. 381 (Experimental group); Relevance M= 33.435, SD=9.110 (Control group) M= 34.864, SD = 3.980 (Experimental group); Confidence M= 33.435 , SD= 7.948 (Control group) M= 34.682 , SD = 6.387 (Experimental group); Satisfaction M= 23.304 , SD= 7.719 (Control group) M= 25.045, SD = 3.214 (Experimental group). The attention scale had two reverse items, the relevance scale had two reverse items, the confidence scale had three reverse items and the satisfaction scale had two reverse items. Refer to Table. 14 for additional information.

Cronbach's Alpha

In this section, the reliability value for the IMMS survey was calculated. A Cronbach alpha coefficient was calculated for the Relevance scale, consisting of Q2_A, Q8_A, Q11_A, Q12_A, Q15_A, Q17_A, Q22_A, Q24_A, Q20_A, Q28_A, Q29_A, and Q31_A. The Cronbach's alpha coefficient was evaluated using the guidelines suggested by George and Mallery (2018) where > .9 excellent, > .8 good, > .7 acceptable, > .6 questionable, > .5 poor, and ≤ .5 unacceptable. The items for Relevance had a Cronbach's alpha coefficient of 0.84, indicating good reliability.

Cronbach’s alpha values for each of the four scales were as follow: Attention $\alpha = 0.84$, Relevance $\alpha = 0.677$, Confidence $\alpha = 0.763$, Satisfaction $\alpha = 0.743$. Additional values such as Confidence intervals and individual item’s reliability statistics presented in Tables 6 through 12 below.

Single-Test Reliability Analysis - Attention

Table 9. Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.840
95% CI lower bound	0.757
95% CI upper bound	0.900

Note. Of the observations, pairwise complete cases were used.

Single-Test Reliability Analysis – Relevance

Table 10. Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.677
95% CI lower bound	0.502
95% CI upper bound	0.799

Note. Of the observations, pairwise complete cases were used.

Table 11. Frequentist Individual Item Reliability Statistics

	If item dropped			
Item	Cronbach's α	Item-rest correlation	mean	sd
Q6_R	0.686	0.125	4.000	0.977
Q9_R	0.695	0.102	4.022	1.158
Q10_R	0.619	0.555	4.444	0.841
Q16_R	0.617	0.535	3.721	0.934
Q18_R	0.665	0.277	3.930	1.078
Q23_R	0.632	0.430	3.628	1.196
Q26_R	0.673	0.292	3.395	1.482
Q30_R	0.636	0.414	3.744	1.157
Q33_R	0.621	0.511	4.256	0.954

Single-Test Reliability Analysis – Confidence

Table 12. Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.763
95% CI lower bound	0.635
95% CI upper bound	0.853

Note. Of the observations, pairwise complete cases were used.

Table 13. Frequentist Individual Item Reliability Statistics

	If item dropped			
Item	Cronbach's α	Item-rest correlation	mean	sd
Q1_C	0.740	0.415	2.933	1.268
Q3_C	0.730	0.526	3.978	0.965
Q4_C	0.730	0.563	3.911	1.062
Q7_C	0.747	0.435	3.689	1.184
Q13_C	0.747	0.420	4.140	0.833
Q19_C	0.743	0.448	4.233	0.841
Q25_C	0.726	0.549	3.953	1.068
Q34_C	0.752	0.378	4.000	1.100
Q35_C	0.756	0.360	4.023	1.144

Single-Test Reliability Analysis – Satisfaction

Table 14. Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.743
95% CI lower bound	0.595
95% CI upper bound	0.844

Note. Of the observations, pairwise complete cases were used.

Table 15. Frequentist Individual Item Reliability Statistics

	If item dropped			
Item	**Cronbach's α**	**Item-rest correlation**	**mean**	**sd**
Q5_S	0.741	0.364	4.133	0.968
Q14_S	0.724	0.400	4.163	0.924
Q21_S	0.674	0.601	4.452	0.889
Q27_S	0.742	0.384	3.628	1.155
Q32_S	0.698	0.524	4.395	0.849
Q36_S	0.655	0.671	4.419	0.823

Pearson Correlation Analysis

The correlation amongst different subsections of the IMMS survey gleaned from the participants of the present study was calculated. The correlation was analyzed for both control and experimental groups and the four subsections of the IMMS including attention, relevance, confidence, and satisfaction.

Filtered By: Groups (Control)

A Pearson correlation analysis was conducted among Attention, Relevance, Confidence, and Satisfaction. Cohen's standard for the evaluate of the strength of the relationships, where coefficients between .10 and .29 indicates a small effect size, coefficients between .30 and .49 shows a moderate effect size, and coefficients above .50 signifies a large effect size was used (Cohen, 1988). There were also two different assumptions of the correlation coefficient that was taken into account.

Assumptions

Bivariate normality. Multiple authors consider bivariate normality an important assumption of the Pearson correlation coefficient (Bonett & Wright, 2000; Chok, 2010). For each pair of variables against the quantiles of a Chi-square distribution, the bivariate normality via

plotting the squared Mahalanobis distances was assessed (DeCarlo, 1997; Field, 2017). In the scatterplot, the solid line represents the theoretical quantiles of a normal distribution. Normality can be assumed if the points form a relatively straight line. The scatterplots for normality are presented in Figure 11 - 12.

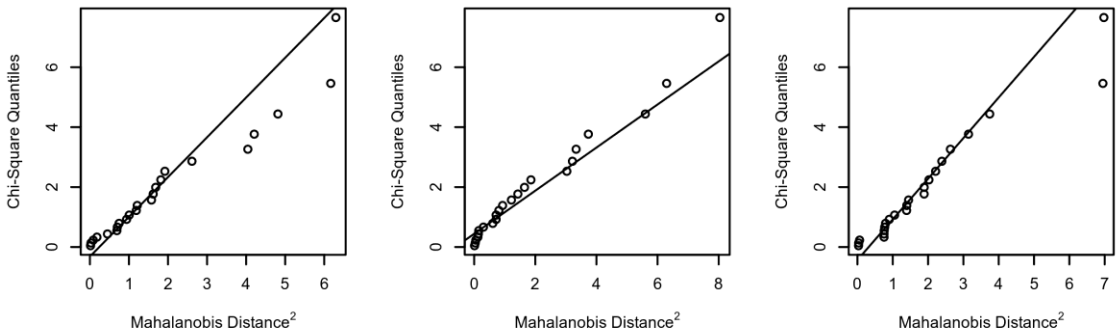

Figure 13. Chi-square Q-Q plot for squared Mahalanobis distances between Attention and Relevance (left), Attention and Confidence (center), and Attention and Satisfaction (right).

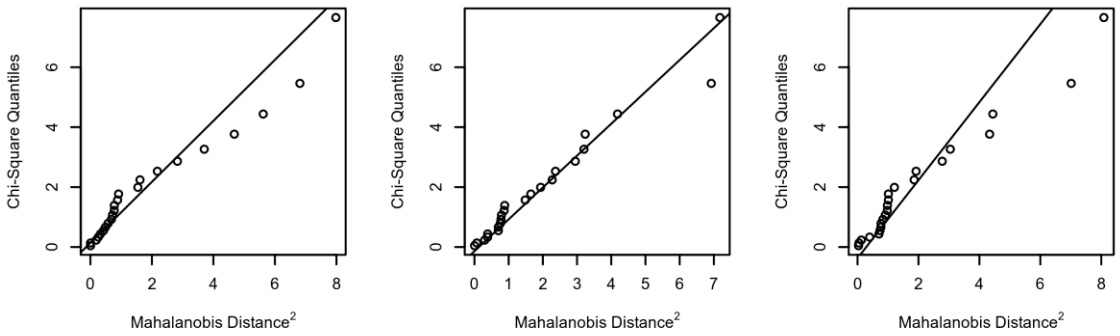

Figure 14. Chi-square Q-Q plot for squared Mahalanobis distances between Relevance and Confidence (left), Relevance and Satisfaction (center), and Confidence and Satisfaction (right)

Results

The result of both groups was examined based on an alpha value of 0.05. A significant positive correlation was observed between Attention and Relevance ($r_p = 0.90$, $p < .001$, 95% CI

[0.78, 0.96]). The correlation coefficient between Attention and Relevance was 0.90, indicating a large effect size. This correlation indicates that as Attention increases, Relevance tends to increase. A significant positive correlation was observed between Attention and Confidence (r_p = 0.84, p < .001, 95% CI [0.65, 0.93]). The correlation coefficient between Attention and Confidence was 0.84, indicating a large effect size. This correlation indicates that as Attention increases, Confidence tends to increase. A significant positive correlation was observed between Attention and Satisfaction (r_p = 0.93, p < .001, 95% CI [0.84, 0.97]). The correlation coefficient between Attention and Satisfaction was 0.93, indicating a large effect size. This correlation indicates that as Attention increases, Satisfaction tends to increase. A significant positive correlation was observed between Relevance and Confidence (r_p = 0.77, p < .001, 95% CI [0.52, 0.90]). The correlation coefficient between Relevance and Confidence was 0.77, indicating a large effect size. This correlation indicates that as Relevance increases, Confidence tends to increase. A significant positive correlation was observed between Relevance and Satisfaction (r_p = 0.93, p < .001, 95% CI [0.83, 0.97]). The correlation coefficient between Relevance and Satisfaction was 0.93, indicating a large effect size. This correlation indicates that as Relevance increases, Satisfaction tends to increase. A significant positive correlation was observed between Confidence and Satisfaction (r_p = 0.87, p < .001, 95% CI [0.72, 0.94]). The correlation coefficient between Confidence and Satisfaction was 0.87, indicating a large effect size. This correlation indicates that as Confidence increases, Satisfaction tends to increase. Table 17 presents the results of the correlations.

Table 16. Pearson Correlation Results Among Attention, Relevance, Confidence, and Satisfaction

	Attention	**Relevance**	**Confidence**	**Satisfaction**
Attention	-			
Relevance	0.90*	-		
Confidence	0.84*.	0.77*	-	
Satisfaction	0.93*	0.93*	0.87*	-

** Correlation is Significant at the 0.01 level.*

Filtered By: Groups (Experimental)

The same procedure was conducted for the control group. Accordingly, a Pearson correlation analysis was administered among Attention, Relevance, Confidence, and Satisfaction. The above-mentioned assumptions were taken into account to come up with robust results.

Assumptions

Bivariate normality. The mentioned Bivariate normality through plotting the squared Mahalanobis distances for each pair of variables against the quantiles of a Chi-square distribution was assessed (DeCarlo, 1997; Field, 2017). In the scatterplot, the solid line indicates the theoretical quantiles of a normal distribution. If the points make a rather straight line, normality is assumed. The following figures represent the scatterplots for normality.

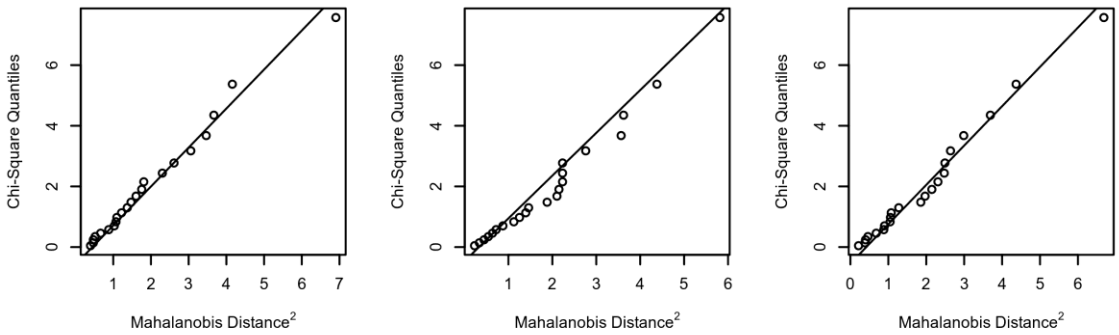

Figure 15. Chi-square Q-Q plot for squared Mahalanobis distances between Attention and Relevance (left), Attention and Confidence (center), and Attention and Satisfaction (right).

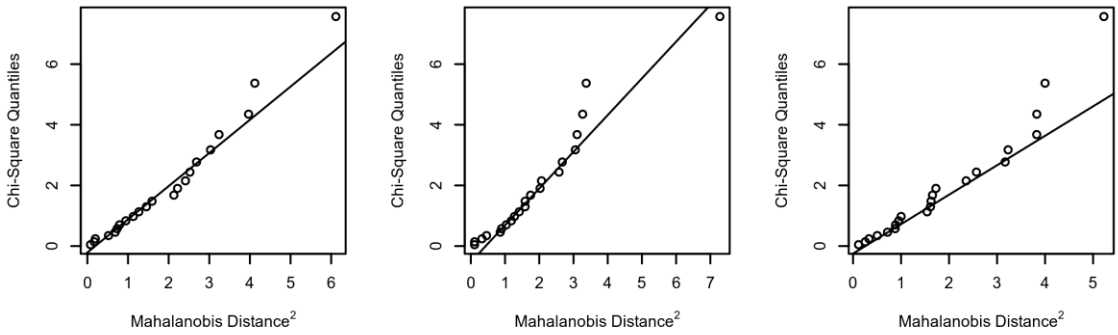

Figure 16. Chi-square Q-Q plot for squared Mahalanobis distances between Relevance and Confidence (left), Relevance and Satisfaction (center), and Confidence and Satisfaction (right).

Results

The result of the correlations was examined based on an alpha value of 0.05. A significant positive correlation was observed between Attention and Relevance ($r_p = 0.69$, $p < .001$, 95% CI [0.38, 0.86]). The correlation coefficient between Attention and Relevance was 0.69, indicating a large effect size. This correlation indicates that as Attention increases, Relevance tends to increase. A significant positive correlation was observed between Attention and Confidence ($r_p = 0.71$, $p < .001$, 95% CI [0.41, 0.87]). The correlation coefficient between Attention and Confidence was 0.71, indicating a large effect size. This correlation indicates that as Attention increases, Confidence tends to increase. A significant positive correlation was observed between Attention and Satisfaction ($r_p = 0.67$, $p < .001$, 95% CI [0.35, 0.85]). The correlation coefficient between Attention and Satisfaction was 0.67, indicating a large effect size. This correlation indicates that as Attention increases, Satisfaction tends to increase. A significant positive correlation was observed between Relevance and Confidence ($r_p = 0.54$, $p = .009$, 95% CI [0.16, 0.78]). The correlation coefficient between Relevance and Confidence was 0.54, indicating a large effect size. This correlation indicates that as Relevance increases, Confidence tends to increase. A significant positive correlation was observed between Relevance and

Satisfaction (r_p = 0.78, p < .001, 95% CI [0.53, 0.90]). The correlation coefficient between Relevance and Satisfaction was 0.78, indicating a large effect size. This correlation indicates that as Relevance increases, Satisfaction tends to increase. A significant positive correlation was observed between Confidence and Satisfaction (r_p = 0.58, p = .005, 95% CI [0.20, 0.80]). The correlation coefficient between Confidence and Satisfaction was 0.58, indicating a large effect size. This correlation indicates that as Confidence increases, Satisfaction tends to increase.

The results of the descriptive statistics are reported in the table below. As such, the control group has 23 participants and 22 participants in the experimental group. Additionally, the results of mode, median, and mean of the tests are reported. The results show that there is no outlier and most of the scores fall under a logical range forming a rather normal distribution.

Table 17. Summarized Descriptive Statistics for Control and Experimental Groups (pre and posttests)

	Group	Attention	Relevance	Confidence	Satisfaction
N	Control	23	23	23	23
	Experimental	22	22	22	22
Mean	Control	44.652	33.435	33.435	23.304
	Experimental	47.955	34.864	34.682	25.045
Median	Control	46.000	35.000	34.000	26.000
	Experimental	46.000	34.000	34.000	25.500
Standard deviation	Control	13.013	9.110	7.948	7.719
	Experimental	6.381	3.980	6.387	3.214
Minimum	Control	12.000	11.000	11.000	3.000
	Experimental	36.000	28.000	22.000	18.000
Maximum	Control	59.000	45.000	44.000	30.000
	Experimental	60.000	41.000	45.000	30.000
Shapiro-Wilk W	Control	0.856	0.896	0.841	0.785
	Experimental	0.964	0.932	0.953	0.948
Shapiro-Wilk p	Control	0.003	0.021	0.002	< .001
	Experimental	0.566	0.136	0.359	0.290

MANOVA

A multivariate analysis of variance (MANOVA) was also conducted to assess if there were significant differences in the linear combination of Attention, Relevance, Confidence, and Satisfaction between the levels of Groups.

Assumptions

In so doing, one must take basic assumptions of MANOVA into consideration to gain robust results with higher power. The following sections detail the underlying assumptions required to calculate MANOVA for the subsections of the IMMS survey.

Multivariate normality. The squared Mahalanobis distances for both model residuals and plotted against the quantiles of a Chi-square distribution to test the assumption of multivariate normality was calculated (DeCarlo, 1997; Field, 2017). In the scatterplot, the solid line represents the theoretical quantiles of a normal distribution. Multivariate normality can be assumed if the points form a relatively straight line. Strong deviations could indicate that the parameter estimates are unreliable and multivariate normality cannot be assumed. The scatterplot for normality is presented in following figure.

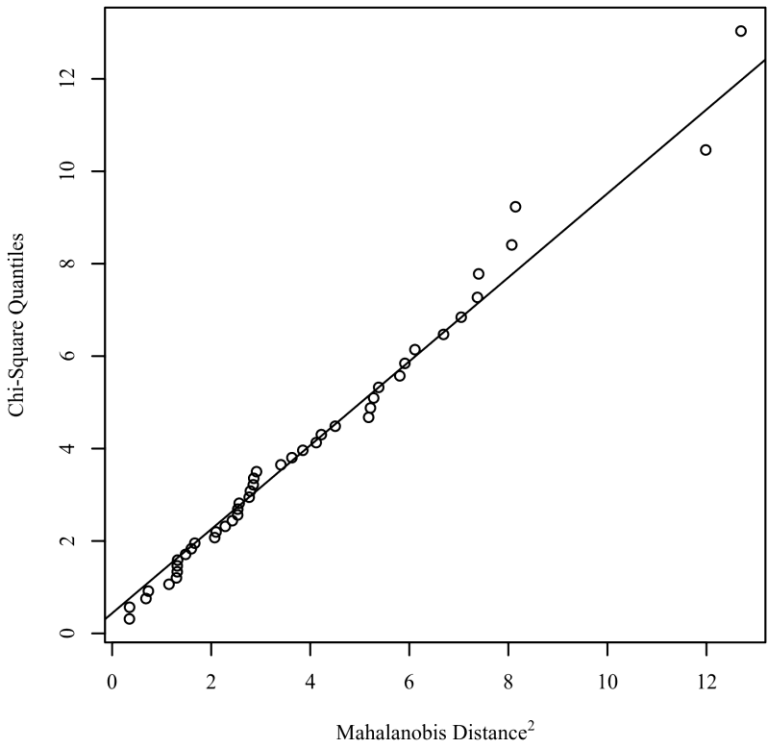

Figure 17. Chi-square Q-Q plot for squared Mahalanobis distances of model residuals to test multivariate normality.

Homogeneity of covariance matrices. To examine the assumption of homogeneity of covariance matrices, Box's M test was conducted. The results were significant based on an alpha value of 0.05, $\chi 2(10) = 20.53$, $p = .025$, indicating that the covariance matrices for each group of Groups were significantly different from one another and that the assumption was not met.

Results

The MANOVA test was conducted to find out if there is a significant difference among the subcategories of motivation (attention, relevance, confidence, and satisfaction). The main effect for Groups was not significant, $F(4, 40) = 0.45$, $p = .775$, $\eta^2_p = 0.04$, suggesting the linear combination of Attention, Relevance, Confidence, and Satisfaction was similar for each level of

Groups. The MANOVA results are presented in Table 20. As shown in the table the power is 0.04. Given the number of the participants, the power is a good number to gain robust results.

Table 18. MANOVA Results for Attention, Relevance, Confidence, and Satisfaction by Groups

Variable	Pillai	*F*	*df*	Residual df	*p*	η_p^2
Groups	0.04	0.45	4	40	.775	0.04

ANOVA - Attention

An analysis of variance (ANOVA) was conducted to determine whether there were significant differences in Attention by Groups. The ANOVA was examined based on an alpha value of 0.05. The results of the ANOVA were not significant, $F(1, 43) = 1.15$, $p = .289$, indicating the differences in Attention among the levels of Groups were all similar (Table 20). The main effect, Groups was not significant, $F(1, 43) = 1.15$, $p = .289$, indicating there were no significant differences of Attention by Groups levels. The means and standard deviations are presented in Table 21. The table indicates that the power is 0.03. This is a satisfactory result.

Table 19. Analysis of Variance Table for Attention by Groups

Term	*SS*	*df*	*F*	*p*	η_p^2
Groups	122.63	1	1.15	.289	0.03
Residuals	4580.17	43			

ANOVA - Relevance

An analysis of variance (ANOVA) was conducted to determine whether there were significant differences in Relevance by Groups. The ANOVA was examined based on an alpha

value of 0.05. The results of the ANOVA were not significant, $F(1, 43) = 0.46$, $p = .502$, indicating the differences in Relevance among the levels of Groups were all similar (Table 8). The main effect, Groups was not significant, $F(1, 43) = 0.46$, $p = .502$, indicating there were no significant differences of Relevance by Groups levels. The means and standard deviations are presented in Table 12. The yielded power is 0.01. It is not a significant number but enough to report the results of the test and make them robust.

Table 20. Analysis of Variance Table for Relevance by Groups

Term	*SS*	*df*	*F*	*p*	η_p^2
Groups	22.96	1	0.46	.502	0.01
Residuals	2158.24	43			

ANOVA - Confidence

An analysis of variance (ANOVA) was conducted to determine whether there were significant differences in Confidence by Groups. The ANOVA was examined based on an alpha value of 0.05. The results of the ANOVA were not significant, $F(1, 43) = 0.33$, $p = .566$, indicating the differences in Confidence among the levels of Groups were all similar (Table 10). The main effect, Groups was not significant, $F(1, 43) = 0.33$, $p = .566$, indicating there were no significant differences of Confidence by Groups levels. The means and standard deviations are presented in Table 12.

Table 21. Analysis of Variance Table for Confidence by Groups

Term	*SS*	*df*	*F*	*p*	η_p^2
Groups	17.49	1	0.33	.566	0.01
Residuals	2246.42	43			

ANOVA - Satisfaction

An analysis of variance (ANOVA) was conducted to determine whether there were significant differences in Satisfaction by Groups. The ANOVA was examined based on an alpha value of 0.05. The results of the ANOVA were not significant, $F(1, 43) = 0.96$, $p = .333$, indicating the differences in Satisfaction among the levels of Groups were all similar (Table 12). The main effect, Groups was not significant, $F(1, 43) = 0.96$, $p = .333$, indicating there were no significant differences of Satisfaction by Groups levels. The means and standard deviations are presented in Table 26.

Table 22. Analysis of Variance Table for Satisfaction by Groups

Term	*SS*	*df*	*F*	*p*	η_p^2
Groups	34.09	1	0.96	.333	0.02
Residuals	1527.82	43			

Effect Sizes (Motivation)

The effect sizes were small in the motivation subscale.

Table 23. Effect Sizes Table

	D	**ci**	**ci**
Attention	0.32	-0.2682	0.9082
Relevance	0.2017	-0.3843	0.7877
Confidence	0.1725	-0.4131	0.7581
Satisfaction	-0.1602	-0.7456	0.4252

Summary of Findings

In this section, the research questions, related findings, and pertinent discussions were put forth. The first research question was:

1. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' motivation?

Based on the research question, the following hypothesis was developed:

1. L2 international students' motivation scores measured by IMMS in the collaborative responsive writing using gamification group are significantly higher than the motivation scores of L2 international students in the classroom learning group.

Research Question 2

What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students' vocabulary achievement?

To gain a better understanding of the results of the pre- and post-tests, the results of the descriptive statistics in the following table are hereby presented. The results of the mean suggest a significant change in the groups before and after the treatment. It also presents minimum, maximum, and standard deviation of the tests across groups for both pre- and post-tests.

Table 24. Summarized Descriptive Statistics for Control and Experimental Groups (pre and posttests)

Type	Group	N	Minimum	Maximum	Mean	Std. Deviation
Control	Pre-test	23 23	7.00	13.00	9.9565	2.05555
	Post-test	23 23	9.00	15.00	12.3043	2.11992
Experimental	Pre-test	22 22	6.00	12.00	9.0455	1.91429
	Post-test	22 22	13.00	15.00	14.3182	0.71623

Two-Tailed Wilcoxon Signed Rank Test - Filtered by Type (Control)

A two-tailed Wilcoxon signed rank test was conducted to examine whether there was a significant difference between Score_Pre and Score_Post. The two-tailed Wilcoxon signed rank test is a non-parametric alternative to the paired samples *t*-test. The two-tailed Wilcoxon signed rank test does not share its distributional assumptions (Conover & Iman, 1981).

Results

The results of the two-tailed Wilcoxon signed rank test were significant based on an alpha value of 0.05, $V = 0.00$, $z = -4.03$, $p < .001$. This indicates that the differences between Score_Pre and Score_Post for the control group are not likely due to random variation. The median of Score_Pre (*Mdn* = 10.00) was significantly lower than the median of Score_Post (*Mdn* = 14.00). Figure 20 presents a boxplot of the ranked values of Score_Pre and Score_Post.

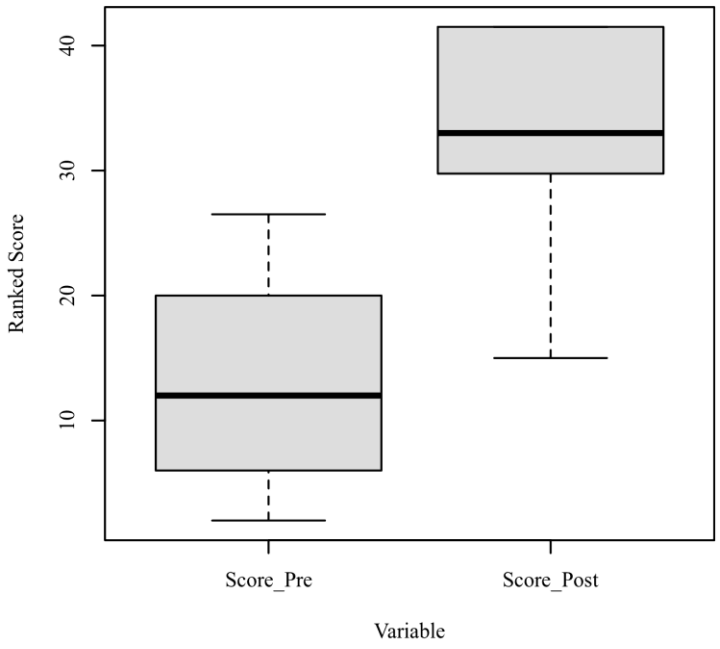

Figure 18. Ranked values of Score_Pre and Score_Post

Two-Tailed Wilcoxon Signed Rank Test - Filtered by: Type (Experimental)

A two-tailed Wilcoxon signed rank test was conducted to examine whether there was a significant difference between Score_Pre and Score_Post for the experimental group. The results of the two-tailed Wilcoxon signed rank test were significant based on an alpha value of 0.05, V = 0.00, z = -4.15, p < .001. This indicates that the differences between Score_Pre and Score_Post are not likely due to random variation. The median of Score_Pre (*Mdn* = 9.00) was significantly lower than the median of Score_Post (*Mdn* = 12.50). Figure 18 presents a boxplot of the ranked values of Score_Pre and Score_Post.

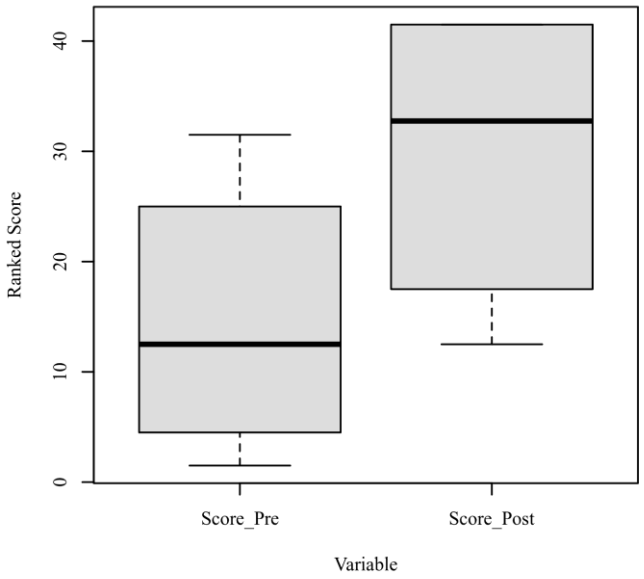

Figure 19. Ranked values of Score_Pre and Score_Post

Two-Tailed Mann-Whitney *U* Test

A Mann-Whitney U test showed that there was no significant difference (U = 185. P = 0.188) in pre-test scores between the control and experiment groups. However, post-test scores

of the experimental group were statistically significantly higher than the control group's scores (U= 155.5, p = 0.022), with effect size $\eta^2 = 0.109$ suggesting a fairly large effect.

Result

Because both groups were approximately similar in the knowledge of vocabulary at the beginning of the experiment (According to Mann-Whitney U test) but there were statistically significant differences between groups—final scores. Due to the experimental group's higher vocabulary gains, the conclusion is that the intervention was affected. In other words, the group that used gamification enhancement learned better.

The second research question was:

1. What is the effect of collaborative responsive writing using gamification, in interactive web-based e-books, on L2 international students 'vocabulary achievement?

Based on this research question, the following hypothesis was crafted:

1. L2 international students' vocabulary learning test scores measured by Vocabulary Level Test in the collaborative responsive writing using gamification group are significantly higher than the vocabulary learning test scores of L2 international students in the classroom learning group.

Summary of Findings

To examine if the mean difference between the pre- and post-tests were significant a Two-Tailed Wilcoxon Signed Rank Test, as a non-parametric test instead of the paired samples *t*-test, was administered. The results suggested that the difference confirmed in the two-tailed paired samples *t*-test is not due to random variation, but the treatment used in the study. The Mann Whitney U Test was run to examine the difference between the control and experimental groups

for vocabulary achievement. The result suggested that the gamification considerably impacted the participants achievement score

Generally speaking, the mean of the pre-test was significantly smaller than the post-test. In the traditional group (control group), the post-test had a bigger mean compared to the pre-test. In the experimental group, the post-test had a larger mean showing that gamification made a significant contribution in the learning gains of the participants. The mean of the experimental post-test was bigger than the control post-test, thus indicating that gamification compared to the traditional methods of teaching and learning English academic words and that it is a working method that can be employed by other practitioners.

Discussion

Multiple studies have indicated that technology, by and of itself, has the potential to increase the learning gains when learning a new language (Chen & Chan, 2019). The results of the present study suggested that gamification built in an interactive web-based e-book contributes to increasing the cognitive attainment of language learners. This contrasts with Khoshnevisan (2020) who stated that the technology used did not make much difference in learning English VP idioms.

Consistent with the ideas of Urh et al. (2015), the present study confirmed that gamification can contribute to the increase in both motivation level and learning gains of English academic vocabulary. Although the results were not significant, gamification was proved to be motivational. Although the related literature puts emphasis on the motivational aspects of gamification, the present study yielded results that confirmed the use of gamification did not make a significant impact on the participants' motivation level (Garone & Nesteriuk, 2019; Simões et al., 2013).

Consistent with prior studies about the impact of computer-supported collaborative writing on learning gains (Dobao, 2012; Erkens et al., 2005; Li, 2015), the present study proved that

collaborative writing could contribute to the increase of the participants' achievements. The study results found that computer-supported collaborative writing was important and can be used as powerful tools to develop students' skills (Calvo et al., 2011; Hadjerrouit, 2014; Li, 2015). Prior studies focused on the use of these tools and found them useful (Gress et al., 2010; Hadjerrouit, 2014; Li, 2015). Nevertheless, the present study did not focus on these tools, but the use of these tools was facilitative.

The present study was conducted within the ambience of an interactive web-based e-book. The impact of these tools was already explored by multiple researchers. In line with the findings of Alsofyani (2019), this study showed that the instruction utilizing these techniques increases the learners' achievements. Other researchers reported the same results when it comes to interactive web-based e-books (Drobisz, 2017; Flemban, 2018; Smith et al., 2013).

In line with Retherford (2020), monitoring the participants' activities during and after the test, gamification was found to serve as a catalyst and helped students bridge their gaps at their own pace. Having checked the quality of peer-feedback in online gamification-based environments, a higher quality coupled with positive achievements in different skills was witnessed (Huang et al., 2019).

The significant role that a new identity plays in language education is not a novel subject; in fact, most adult students deal with the issue of identity when it comes to learning a new language. In an ESL context, where students may suffer from and deal with a variety of issues in their everyday life, taking on a new identity is an opportunity to alleviate the students of stress and make them become relieved in the process of language education. From the pool of games used in language education, the choice to utilize a role-play inference game was because this type of game creates a novel atmosphere where students can interact and learn. Students who are not considered

risk-takers can exploit the opportunity and engage in the inference game along as well. Inferencing is the key concept for L2 vocabulary learning and a primary element of text comprehension (Smith et al., 2013).

The backbone of second language acquisition is supported by five different hypotheses: the Acquisition-Learning hypothesis; the Monitor hypothesis; the Input hypothesis; and the Affective Filter hypothesis; and the Natural Order hypothesis. Gamification can inherently foster acquisition rather than education when it comes to learning a second language as an adult learner. Krashen (1982) deems that first language is effortlessly acquired without receiving formal instructions. Gamification, by the same token, diminishes the amount of effort required when learning a second language. It is true that language learners need to put forth some effort when learning a second language. Nonetheless, when second language learners are involved in language education via gamification, they will need to put less effort in to the subject. It is then well aligned with the idea of acquisition where language learners use less effort and have more time to live their lives. In this study, leaderboards and peer feedback were tools to observe the tenets of monitoring hypotheses. These tools enabled learners to monitor what they are producing in their newly acquired language and correct their errors via planning and editing. Monitoring posits that the production of language needs to be monitored and scrutinized by learners in order to be edited and corrected. Further, peer feedback helped students to produce accurate language within their responses. This ultimately enables learners to self-correct their language production and move towards autonomy. Monitoring is developed in advanced levels of learning a language when an individual is able to not only identify but also self-correct his errors.

Affective filter is another significant element in learning a second language. Krashen (1982) posits that there is a variety of affective elements that can act as either facilitative or

debilitative. In the domain of language education, facilitative affective elements need to be fostered and debilitative ones need to be hampered so language education is acquired with the least amount of effort. In this study, the use of gamification fostered facilitative elements in the domain of affective elements. Role play inference games supplied the users with a novel identity. They could even change their avatars to take on a completely new identity. This new identity by the use of role play inference games and gamification increased the motivation level, learning games, and lowered the affective filter.

It is true that gamification did not considerably increase the motivation level of the participants in this study. However, there is a myriad of underlying reasons why the participants' level of motivation did not change dramatically. Amongst the pool of reasons, the pandemic is an important factor to take into account. When the pandemic struck the United States, almost all programs were transferred to an online mode of content delivery. The enormous migration of programs from the real world to the online world imposed several limitations to the success of international students. Almost all international students went back to their countries and had no access to physical facilities on campus. They could not meet their instructors face-to-face and had to complete their courses in an online mode. This imposes limitations on the students' communication both with their instructors and with their peers. Accordingly, the vast majority of the students in post-COVID era are not motivated to follow their studies. It is thus evident that the use of one form of technology in two sessions might not dramatically increase the motivation level of the students who were engaged in learning English academic words. However, the motivation level of the students was slightly increased. Gamification may have been a contributing cause of this. Additionally, the increase in the students' learning gains suggest that gamification, along with

other elements of the intervention, may have exerted a positive impact on the students' performance.

The results of the present study reaffirmed that gamification has a positive impact on the students' cognitive attainment. Consistent with prior studies in the literature (Simões et al., 2013; Garone & Nesteriuk, 2019), gamification can contribute to an increase in the students' achievement. Although the results showed that even traditional ways of teaching academic vocabulary with printed materials can be useful but using gamification can significantly contribute to the success of the students.

Chapter Five:

Discussion

Introduction

While embracing a quantitative design method for this study, a concerted effort to scrutinize the impact of using gamification coupled with collaborative responsive writing, in web-based e-books, on the motivation level of the participants and measure the tentative changes in the participants' cognitive attainment was made. Multiple individuals had already conducted research within the milieu of web-based e-books on different aspects of language education. This study focused on the learning of English academic words that are an impediment for English language learners. Also, this was one of the few studies that included international students to measure their learning gains using the mentioned techniques. Other studies solely recruited students in their native countries. However, recruitment of international students gleaned different results and findings as put forth in Chapter Four. Chapter Five primarily presents a summary of findings that was presented in detail in Chapter Four. Then, limitations and delimitations imposed on the process of the study was put forth, followed by pedagogical implications, and future research questions. In this section, several recommendations are presented so emerging researchers in the field can employ them to conduct future studies to enrich the pertinent literature. The recommendations made throughout this chapter usher the path forward for future researchers, students, and professors.

Summary of Findings

The main cause to conduct the present study was to test the impact of gamification in the field of language education. More specifically, this study was an attempt to test the effects of using collaborative responsive writing together with gamification on learning English academic words. Multiple researchers have already employed an array of technologies and technological tools to pave the way for both language teachers and students. There are conflicting results in prior studies as some of them showed positive impact of technology. Yet, several studies suggested that technology had no impact on the findings. This study, however, used gamification, collaborative responsive writing, and web-based e-books to measure the motivation level and learning gains of the students. Consistent with prior studies (Khoshnevisan, 2020), gamification increased the motivation level of the participants, but this difference was not statistically significant. The main reason behind this finding was because international students come from different backgrounds where they do not receive many technological tools to learn a new language. Additionally, the participants just received this technological help in two sessions. If the students benefit from this technology within a semester or more the results might be different, and the tool can increase the students' motivational level to a large extent.

COVID-19 is a factor that every researcher needs to take into account. This pandemic could have immensely impacted the result of the study. Being concerned about the pandemic, the technology could not highly impact the students' motivation level. Accordingly, the researcher cannot generalize the results of the study in the motivation sector to other studies. Other researchers need to conduct the same study in different contexts (EFL & ESL) and with different populations (college students, secondary students, kindergarteners, etc.).

The results of the study regarding the impact of technology on the students' learning gains were promising. The participants used both gamification and collaborative responsive writing within groups to learn English academic vocabulary. The participants learning gains were measured using two tests (pre- and post-tests). The results of the tests suggest that the use of gamification, along with the role-playing game and the online modality, may make a difference. The mean vocabulary scores attained by the experimental group were significantly higher than the mean vocabulary score of the control group. The results must await future studies recruiting other populations to either confirm of disconfirm the results of this study. In short, gamification together with collaborative responsive writing in web-based e-books works perfect for international students when learning English academic words.

Embracing multiple statistical procedures such as Correlation coefficient, MANOVA, and ANOVA, it was disclosed that there is a strong and positive correlation between the subsections of the instructional material motivation survey (IMMS)—attention, relevance, confidence, and satisfaction. This was consistent across all groups (control and experimental). The results of the MANOVA test suggested that there wasn't a statistically significant impact on the participants' motivation level. To investigate likely significant differences of the subcategories of the IMMS by groups, an ANOVA test was employed. The results indicated that gamification did not make a significant difference in the subsections of motivation (attention, relevance, confidence, and satisfaction) across both groups. Prior studies on the use of the ARCS model in increasing the motivation level of the participants' suggested the same results. For instance, Khoshnevisan (2020) conducted a study on the impact of AR flashcards on learning English VP idioms. The results of the study indicated that the technology employed (AR flashcards) did not increase the motivation level of the participants. In other words, there was no difference in terms of attention, relevance,

confidence, and satisfaction between the experimental and control group. Consistent with previous studies (Gabrielle, 2003; Keller, 2010), the results of this study showed that the four subcategories of IMMS are correlated. In contrast, previous studies, such as Di Serio et al. (2013) and Solak and Cakir (2015), indicated that the technologies used had a considerable impact on the participants' motivation level. Although previous researchers have corroborated that achievement and motivation are positively correlated (Barreira et al., 2012; Ibanez et al., 2014; Lui et al., 2010; Mahadzir & Phung, 2013), the present study showed that low, non-significant, increase in motivation level can be associated with a significant increase in achievement.

The results of this study suggested that the use of gamification within an interactive web-based eBook system (IMapBook) with collaborative responsive writing made no statistically significant difference in the motivation level of the participants in this study. It is true that technology affords educators with many different tools and the potential to increase the students' motivation level. However, this is not the first study in the domain of language education that indicates technology did not make a significant difference in the motivation level of the participants. Consistent with the findings of the present study, Khoshnevisan (2020) used AR flashcards to examine the impact of the technology on learning English VP idioms. His study confirmed the results of this research endeavor that even if technology offers more, it does not necessarily make a significant difference in the motivational level of the participants. Khoshnevisan (2020) went on to say that the novelty of the technology used can be taken into consideration as a disturbing element for the participants.

Prior use of an interactive web-based eBook system (IMapBook) includes interactive e-book environment (Flemban, 2018; Alsofyani, 2019); animated pedagogical agents (Drobisz, 2017); digital pedagogical agent (Nielen et al., 2018); computer games (Smith et al., 2013);

computer games and reading texts (Smith et al., 2011); IMapBook and games (Gill & Smith, 2013). In this sense, this was the first study that examined the use of gamification in an interactive web-based eBooks system (IMapBook) on the motivation level of the students. As discussed earlier, the use of the technology slightly changed the participants' motivation level, but the difference was not statistically significant.

Although this study did not investigate the impact of different games on the participants' motivation and learning gains, it seems reasonable that the type of game used should impact the participants' performance in an internet-based game activity. Assuredly, in this study, the participants mentioned that they liked the type of game used as well as the interface of the technology through which they learned English academic words. To what extent does each game impact the participants' performance could be the topic of a new study. However, through informal chats with students and teachers, I found that gaining a new identity through the course of language education can produce quality performance, since students feel more confident and secure making errors in a role-playing game and with gamification than might with other more traditional classroom interactions, and thus perhaps learn a new language more easily. Other games that do not take identity into account might seem scary and challenging to adult students. Many adult international students have not used games for learning a new language either in their country or in the United states. Accordingly, using a game and gamification might be challenging for adult international language learners. The results of this study may support the assumption that the use of games and gamification serves as a catalyst in learning English academic vocabulary. It not only may have diminished the students' stress through inference games, but also perhaps may have motivated students to some extent.

Ultimately, the experimental group had significantly better vocabulary achievement than the control group. As per Table 5, there were four elements present in the experimental condition, but not in the control condition: 1) role-play inference game/game-based learning (GBL), 2) peer feedback on collaborative writing, 3) leaderboard/competition, and 4) online learning modality. It is not possible to infer the individual contributions of each of these four differences. However, my observations suggest that gamification, peer feedback, and inference games all played major roles, perhaps in that order of importance. This study does provide a model for practitioners, namely that the bundling of GBL and social gamification features is extremely likely to improve achievement in vocabulary learning.

Limitations and Delimitations

Every scientific study is designed with several limitations and delimitations stemming from the context, research design, and many more that create its constraints. This section details some of the many limitations that were imposed on me, as the researcher, in this study. Further, the delimitations burgeoned from the research design employed in the present study is put forth.

Since the present study was conducted during tough times (COVID-19), it is possible that the potential of the tools used in this study, including internet-based E-books, inference games, gamification, and leaderboards, were not completely unleashed. There is a myriad of aspects that were not unlocked and/or discovered. A study that juxtaposes the technologies and games might be an effective tool to uncover other aspects and potential of the games.

The current pandemic known as COVID-19 imposed a variety of limitations to both design and implementations of this study. For one thing, the pandemic vastly impacted participant levels for the present study because most programs emigrated to an online mode of educational delivery. Due to this, there were fewer number of participants (45 participants). Another important point to

mention is that due to the number of the participants, the statistics of the study through nonparametric and it limits the generalizability of the present study. It also imposed the researcher to report the results with lower power. Given the COVID-19 pandemic, the study could not be conducted solely within two classrooms but in four groups to have more participants. This also imposed more statistical procedures in Chapter Four of this dissertation.

The current research design employed was solely quantitative and the qualitative section regarding the opinions of the participants and teachers was missing. A qualitative study can unfold the opinions of teachers and the students about the use of collaborative responsive writing and gamification, in interactive web-based e-books, on L2 international students' achievement.

Last but not least, this was a solely quantitative study lacking the qualitative section of a study. In other words, the results of this study merely took the numbers and statistics into consideration without including the perceptions of the stakeholders. The main stakeholders are researchers, teachers, students, curriculum designers, instructional designers, and school managers. Gaining the perceptions and experiences of the mentioned people can enrich our understanding about gamification, responsive collaborative writing, and web-based e-books. Having conducted the present study, I gained insight into the impact of these technologies on the motivation level and learning gains of the participants. However, I do not know the underlying reason behind these findings. To unlock the perceptions and experiences of the stakeholders, a qualitative study needs to be conducted. For instance, an interview can unearth the reason why students did not show much change in the motivation level but their cognitive attainments. Qualitative studies are the only tools can be employed to find out the experiences of the participants and teachers and tailor the technology accordingly. Future studies can be conducted with more participants and with

interviews to know the reasons behind a tentative increase in the motivation level and cognitive attainment of the participants.

Pedagogical Implications

The results of this study corroborated the results of prior studies in that gamification and collaborative responsive writing are important tools to facilitate the process of learning English academic vocabulary. As academic vocabulary is an impediment in the way of college students, educators and material designers can use this tool to make learning both fun and easy. It is thus evident that the future material is interspersed with gamification. Gamification has the potential to motivate language learners when effectively integrated with the material. Gamification can also be used in both printed and digital material so language teachers across the spectrum of technology can employ this tool to foster learning English academic vocabulary in and out of the classrooms.

Another important tool to be used in learning English academic vocabulary is collaborative responsive writing which was used in this study. It was found that students were learning from one another when they were grouped to leave their ideas in the framework of collaborative writing. Students were also responding to each other by giving and receiving feedback in the form of writing. This enriched writing style, use of vocabulary, and finally learning the meaning of English academic vocabulary. Additionally, the students were afforded to write their questions, feedback, and responses in an interactive web-based e-book. This enabled the students to not only acquire knowledge but also foster rapport among the students in different groups.

Finally, interactive web-based e-books are novel tools used in the domain of language education. These tools can enrich learning a new language by providing audio-visual material using dual code theory. These tools may not be easy for teachers to create but material designers and instructional designers need to team up with language teachers to craft appropriate material

within these tools. Interactive web-based e-books are unique tools to offer a variety of activities for language learners.

It is thus evident that my opinions in this section are based on my experiences with the participants and other international students. Other than that, I did not conduct a scientific study to explore the experiences of the participants. This type of study lends itself to more qualitative studies. Qualitative studies have the potential to excavate this type of data, so researchers and other stakeholders know the reason behind gleaned statistics. Accordingly, future qualitative studies can usher the path of the use of gamification in language education.

An oft-neglected drawback in the use of technology is a lack of knowledge on the teachers' side. Language teachers are not fully equipped with the knowledge of using and crafting technologies. In this study and in the process of conducting this research, I found that many language teachers do not feel safe to utilize technological tools in their classrooms. This lack of confidence lead teachers not to use available technologies and technological tools in their classrooms. I found that even if I intended to prepare language teachers to use this technology, educate them, and assist them to use it in their classrooms, they were not apt to employ it in their daily instruction. It proves that future professional development for in-service teachers and teacher education courses for preservice teachers need to include courses for the use and development of basic technological tools in language education. Otherwise, language teachers either do not use them or do not feel confident to use them. I also found that if language teachers team up with instructional technologies, then they may come up with effective instructions. I experienced that language teachers were more confident after my instructions and other teachers in the school asked me if they can learn and use this technology in the school. It is thus evident that curriculum designers, school principals, and language teachers would like to use emerging technologies

integrated with language learning but they either have no idea how to develop them or they do not feel confident to use them.

Future Research Recommendations

Future research studies must be conducted to unfold the ideas of both teachers and students regarding interactive web-based e-books, gamification, and collaborative responsive writing. A mixed method study is imperative to measure motivation level, learning gains, and explore the ideas of stakeholders while using these tools for learning English academic vocabulary. Understanding the notions of the users can help material designers and teachers to tailor the tools to better accommodate the needs of language learners.

The current pandemic impeded the researcher from recruiting more participants to generalize the results of the study to the whole population. Accordingly, future studies may recruit more students and generalize the results of the studies. More participants may yield different results such as motivational aspects of gamification, collaborative responsive writing, and interactive web-based e-books.

Using a novel technology in the field of language education is interspersed with many challenges. Future studies can reiterate the use of different technologies and technological tools to juxtapose them and find both strength and weakness of gamification, collaborative responsive writing, and web-based e-books. The comparison can give us a rather comprehensive picture of how different technologies impact on the motivation level and cognitive attainment of the participants. The participants can come from different populations, nationalities, and levels. To portray a comprehensive picture of the use of these technologies in learning English academic vocabulary, the stakeholders can generalize the use of the mentioned technologies to the whole population with a higher statistical power. Hence, practitioners and material developers can

develop and use the technologies with confidence to augment the level of international students when learning English academic words.

Future studies can employ gamification, collaborative responsive writing, and web-based e-books in learning other language skills and sub skills such as listening, speaking, reading, writing, pronunciation, etc. Prior researchers have used these technologies in few different language domains but to gain an in-depth understanding of the impact of these technologies on the participants' learning, we need to focus on other skills and subskills in future studies.

Conclusion

Chapter Four presents the findings pertinent to the research questions put forth in Chapter Three. The purpose of the present study was twofold: it scrutinized how gamification and collaborative responsive writing, in interactive web-based e-books, can impact L2 international students' motivation level and learning gains in learning academic vocabulary. This study examined how adding gamification strategies to collaborative responsive writing, in interactive web-based e-books, may amplify L2 international students' motivation and achievement in learning academic vocabulary. To address the first research question, I utilized MANOVA and ANOVA tests. The results of Cronbach alpha showed that there was a strong correlation between components of the IMMS survey (attention, relevance, confidence, and satisfaction). Through the MANOVA test, I found that gamification has some impact on the participants' motivation level but for several reasons this impact was not statistically significant. From the pool of reasons, the most significant one was the novelty of the technology and the number of sessions that the students work with the technology. Another important reason could be the pandemic that limited the teacher-student interactions. In short, while the MANOVA test suggested that there is some

difference amongst experimental and control groups, the results of the ANOVA test showed that for the mentioned reasons this difference was not considerable.

To examine if the mean difference between the pre- and post-tests were significant, I used a Two-Tailed Wilcoxon Signed Rank Test. The results of the test indicated that there is a difference amongst the groups participated in this study. It confirmed that the treatment used in this study made a difference. To reassure there was a difference, I adopted Mann-Whitney U test across groups. The results showed that there was a statistically significant difference among groups and levels. The results implied that the post-tests in both groups (control and experimental) had a higher mean showing that the treatments (traditional and gamification) positively impacted on the participants learning gains. Additionally, it was evident that the post-test of the experimental group gained a higher impact compared to the post-test in the control group. In other words, gamification together with collaborative responsive writing could serve as a catalyst to facilitate learning English academic words compared to traditional methods of teaching and learning words. It can be then concluded that gamification, collaborative responsive writing, and web-based e-books could help the international students to improve their understanding of academic English words within the milieu of learning English as a second language in the Unites States of America. It was thus recommended that instructional designers, curriculum designers, practitioners, and other stakeholders take these technologies into account.

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Appendix A: Demographic Survey

1. Gender:

- o Male
- o Female

2. Age:

- o 18-23 years old
- o 24-29 years old
- o 30-35 years old
- o 36-40 years old
- o 41-46 years old

3. Your native language:

- o Arabic
- o Bengali, Hindi
- o Malay, Javanese
- o Mandarin
- o Vietnamese
- o Korean
- o Japanese
- o Spanish, French, Portuguese
- o Russian
- o Chinese
- o Other

4. Current English level in the institution

- o Level 1
- o Level 2
- o Level 3
- o Level 4
- o Level 5
- o Level 6

5. How long have you been studying English at English learning Institutions?

- o less than 6 months
- o less than one year
- o more than one year

6. The latest scores of English skill tests TOEFL (Test of English as a Foreign Language):

- o 0-31
- o 32-59
- o 60-93
- o 94-120
- o Not applicable

7. The latest scores of English skill tests IELTS (International English Language Testing System):

- o 0-4
- o 4.5-5.5
- o 6-6.5
- o 7-9
- o Not applicable

8. How would you rate your academic English proficiency?

- o lowest
- o low
- o average
- o good
- o very good

Appendix B: Instructional Material Motivation Survey (IMMS)

Instructions

Instructional Material Motivation Survey

There are 36 statements in this questionnaire. Please think about each statement in relation to the instructional material you have just studied and indicate how true it is. Give the answer that truly applies to you, and not what you would like to be true, or what you think others want to hear.

Think about each statement by itself and indicate how true it is. Do not be influenced by your answers to other statements.

Record your responses by clicking on the icons of the Likert-type scales and follow any additional instructions that may be provided in regard. Thank you.

Use the following values to indicate your response to each item.

1 = Not true

2 = Slightly true

3 = Moderately true

4 = Mostly true

5 = Very true

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1. When I first looked at learn academic vocabulary activities, I had the impression that it would be easy for me.
2. There was something interesting at the beginning of the learn academic vocabulary activities that got my attention.
3. These learn academic vocabulary activities were more difficult to understand than I would like for them to be.
4. After reading the introductory information, I felt confident that I knew what I was supposed to learn from learn academic vocabulary activities.

5. Completing the learn academic vocabulary activities in this lesson gave me a satisfying feeling of accomplishment.

6. It is clear to me how the content of this material is related to things I already know.

7. Many of the learn academic vocabulary activities had so much information that it was hard to pick out and remember the important points.

8. These materials are eye-catching.

9. There were stories, pictures, or examples that showed me how this material in learn academic vocabulary could be important to some people.

10. Completing all learn academic vocabulary activities successfully was important to me.

11. The quality of learn academic vocabulary activities helped to hold my attention.

12. This lesson is so abstract that it was hard to keep my attention on it.

13. As I worked on learn academic vocabulary activities, I was confident that I could learn the content.

14. I enjoyed the learn academic vocabulary activities so much that I would like to know more about academic vocabulary.

15. The content of learn academic vocabulary activities look dry and unappealing.

16. The content of this material is relevant to my interests.

17. The way the information is arranged in learn academic vocabulary activities helped keep my attention.

18. There are explanations or examples of how people use academic vocabulary.

19. The exercises in learn academic vocabulary activities were too difficult.

20. These learn academic vocabulary activities have things that stimulated my curiosity.

21. I really enjoyed studying academic vocabulary.

22. The amount of repetition in this lesson caused me to get bored sometimes.

23. The content and style of writing in this lesson convey the impression that its content is worth knowing.

24. I learned some things that were surprising or unexpected.

25. After working on this lesson for a while, I was confident that I would be able to pass a test on it.

26. This lesson was not relevant to my needs because I already knew most of it.

27.The wording of peer feedback after the exercises, and leaderboard comments in this lesson, helped me feel rewarded for my effort.

28. The variety of explanations, exercises, illustrations, etc., helped keep my attention on the lesson.

29.The style of writing is boring.

30. I could relate the content of this lesson to things I have seen, done, or thought about in my own life.

31. There are so many words in each learn academic vocabulary activity that it is irritating.

32. It felt good to successfully complete this vocabulary lesson.

33. The content of this vocabulary lesson will be useful to me.

34. I could not really understand quite a bit of activities in this vocabulary lesson.

35. The good organization of the content helped me be confident that I would learn the vocabulary.

36. It was a pleasure to work on such well-designed learn academic vocabulary activities.

Appendix C: Vocabulary Test

Please match the words with their definitions, the first one done for you:

15 Multiple choice questions

1. checking, inspecting, studying

- Specific
- Manipulate
- Examining
- Integration

2. having the identity known or established

- Integration
- Examining
- Investigation
- Identified

3. a way of doing something
- Global
- Manipulate
- Psychology
- Method

4. to handle or use skillfully
- Motivation
- Manipulate
- Demonstrate
- Integration

5. Show by example
- Psychology
- Integration
- Demonstrate
- Manipulate

6. guessed
- Examining
- Estimated
- Motivation
- Demonstrate

7. reason for believing something is or is not true
- Motivation
- Specific
- Analysis
- Evidence

8. the reason or reasons one has for acting or behaving in a particular way.
- Motivation
- Manipulate
- Integration
- Investigation

9. Study of the mind
- Manipulate
- Demonstrate
- Integration
- Psychology

10. to worry
- Evidence
- Global
- Concern
- Specific

11. joining something into a whole
- Motivation
- Manipulate
- Integration
- Investigation

12. trying to find information about something
- Investigation
- Motivation
- Specific
- Integration

13. to describe or explain clearly, to name exactly
- Evidence
- Examining
- Specific

- Analysis

14. Worldwide
- Estimated
- Method
- Global
- Concern

15. A detailed examination of the elements or structure of something.
- Evidence
- Specific
- Analysis
- Examining

Appendix D: Sample of the Design Vocabulary Activities in the IMAP E-book

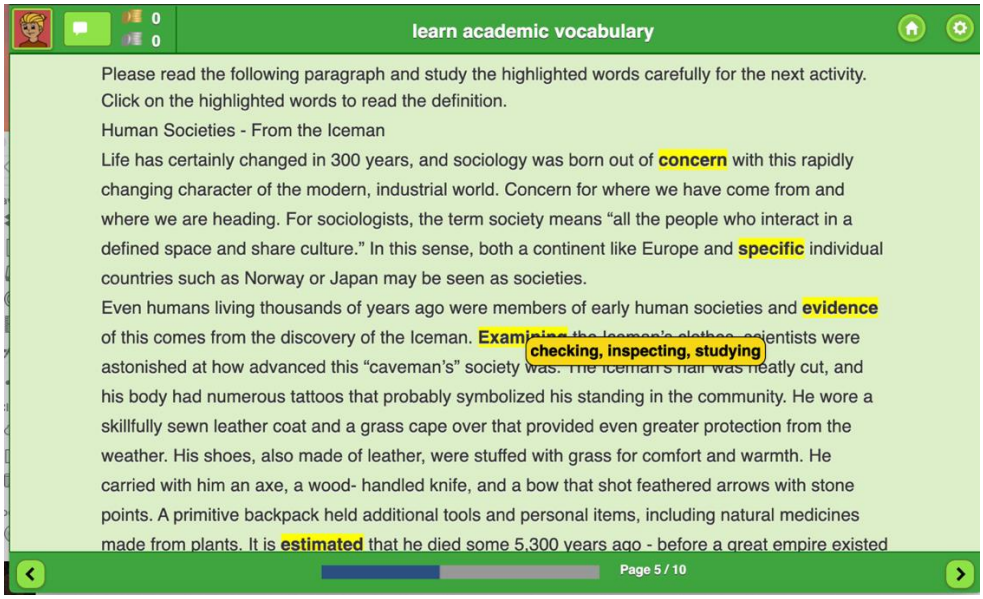

Figure 20A. Vocabulary Activity Example 1

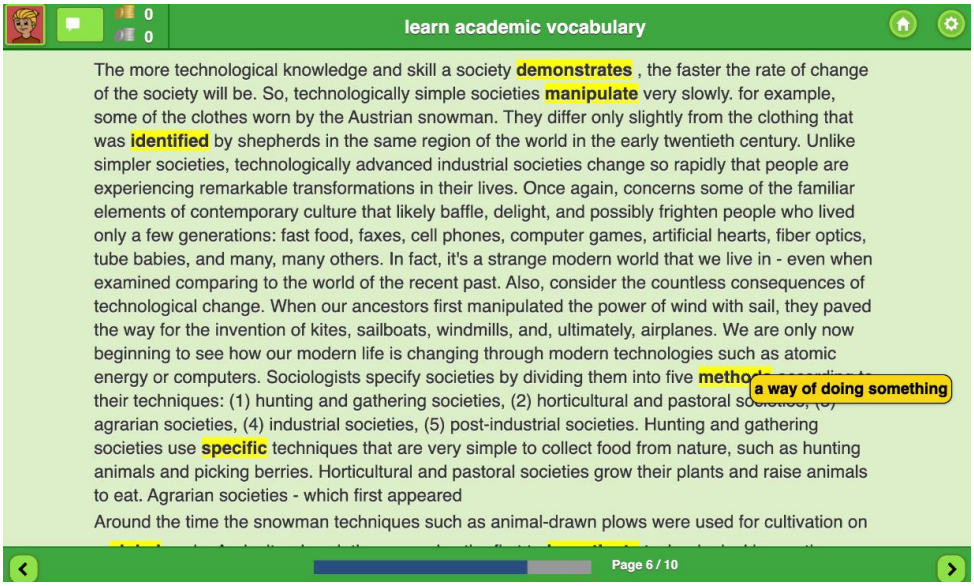

Figure 21B. Vocabulary Activity Example 2

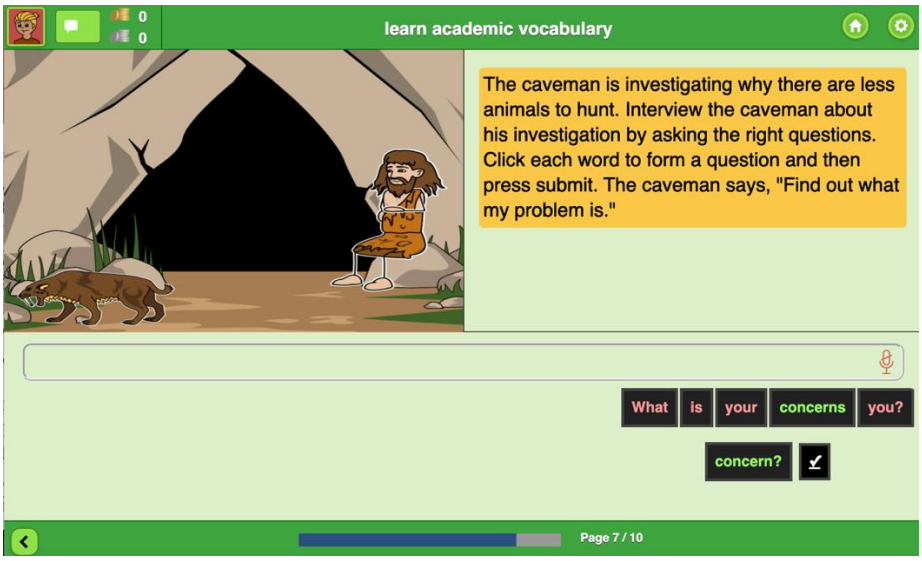

Figure 22C. Vocabulary Activity Example 3

Figure 23D. Vocabulary Activity Example 4

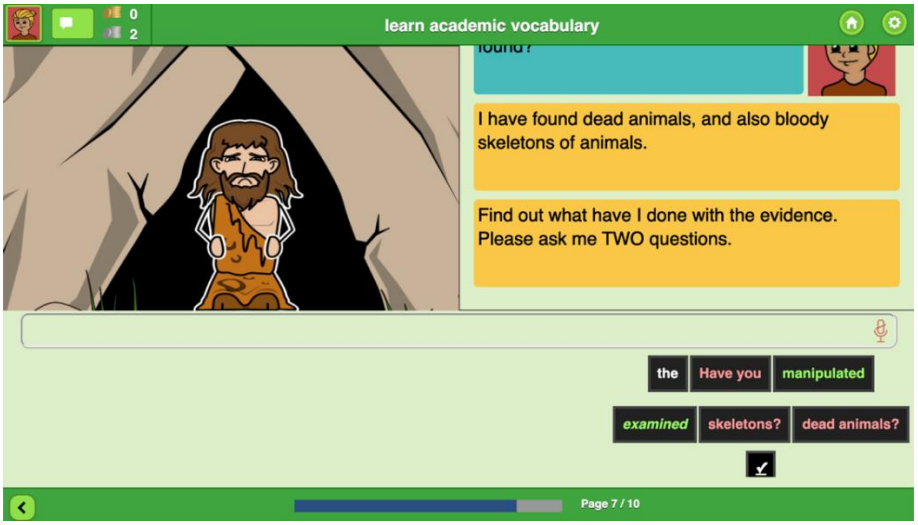

Figure 24E. Vocabulary Activity Example 5

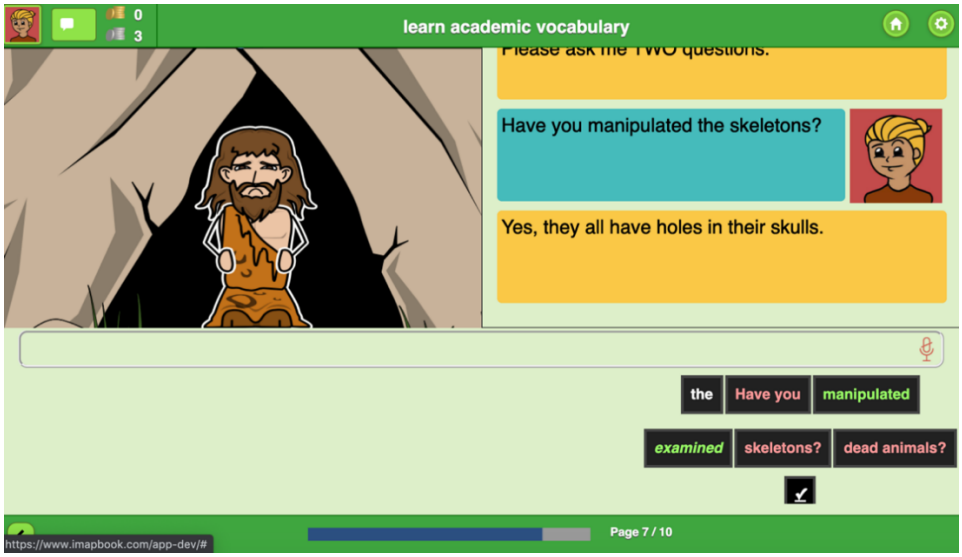

Figure 25F. Vocabulary Activity Example 6

Figure 26G. Vocabulary Activity Example 7

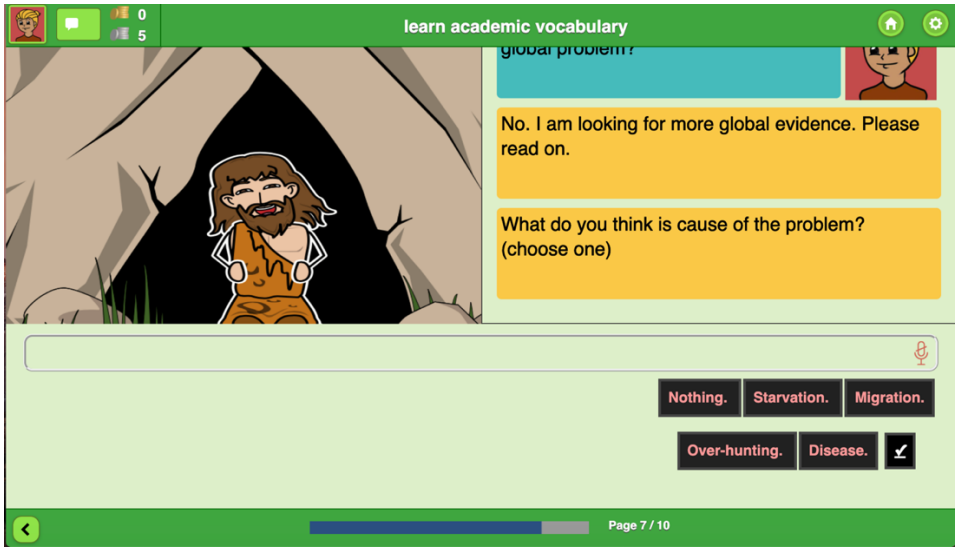

Figure 27H. Vocabulary Activity Example 8

Figure 28I. Vocabulary Activity Example 9

Figure 29J. Vocabulary Activity Example 10

Appendix E: IRB Approval

March 11, 2021

Rabea Alfahad
9414 Leatherwood Ave Tampa, FL 33647

EXEMPT DETERMINATION

Dear Ms. Rabea Alfahad:
On 3/11/2021, the IRB reviewed and approved the following protocol:

Application Type:	Initial Study
IRB ID:	STUDY002106
Review Type:	Exempt 1
Title:	Gamifying the CREW: Effects of collaborative responsive writing versus gamification, in interactive web-based e-books, on L2 international students' learning of academic vocabulary.
Funding:	None
Protocol:	• Protocol.1_clean version

The IRB determined that this protocol meets the criteria for exemption from IRB review

In conducting this protocol, you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Please note, as per USF policy, once the exempt determination is made, the application is closed in BullsIRB. This does not limit your ability to conduct the research. Any proposed or anticipated change to the study design that was previously declared exempt from IRB oversight must be submitted to the IRB as a new study prior to initiation of the change. However, administrative changes, including changes in research personnel, do not warrant a modification or new application.

Ongoing IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any

changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a new request to the IRB for a determination.

Sincerely,

Institutional Review Boards / Research Integrity & Compliance

FWA No. 00001669
University of South Florida / 3702 Spectrum Blvd., Suite 165 / Tampa, FL 33612 974-5638

/ 813-

UNIVERSITY of SOUTH FLORIDA

Katrina Johnson
IRB Research Compliance Administrator

Institutional Review Boards / Research Integrity & Compliance

FWA No. 00001669
University of South Florida / 3702 Spectrum Blvd., Suite 165 / Tampa, FL 33612 974-5638

/ 813-

Appendix F: Informed Consent Form

n Research

Information to Consider Before Taking Part in this Research Study

Title: Gamifying the CREW: Effects of collaborative responsive writing versus gamification, in interactive web-based e-books, on L2 international students' learning of academic vocabulary.

Study # 002106

Overview: You are being asked to take part in a research study. The information in this document should help you to decide if you would like to participate. This document is called an Informed Consent form. Please read this information carefully and take your time to make a decision. You may ask the researcher or the study staff to discuss any portion of the consent form with you or to explain words and information you may have difficulty understanding. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are listed below. This research study is entitled: **Gamifying the CREW: Effects of collaborative responsive writing versus gamification, in interactive web-based e-books, on L2 international students' learning of academic vocabulary.** *Rabea Alfahad* is the person who is in charge of this research study. This person is called the Principal Investigator. However, other research staff may be involved, and may act on behalf of the person in charge.

Purpose of the study

The research will be conducted at Tampa Language Center in Tampa, Florida. The purpose of this quantitative study was twofold: It primarily investigates how collaborative responsive writing, in interactive web-based e-books, can affect L2 international students' motivation and achievement in learning academic vocabulary. Additionally, the study will examine how adding gamification strategies to collaborative responsive writing, in interactive web-based e-books, may amplify L2 international students' motivation and achievement in learning academic vocabulary.

Why are you being asked to take part?

You are being asked to take part in this research study because you are an adult English learner, undergraduate and intermediate language proficiency level at the English Language Institution in United States.

Study Procedures

If you choose to participants in this study, the classes will randomly assign, and the study participants will be divided in groups, experimental groups and control group. The study will be in three sessions. Each session will take no more than an hour of your time and will take place during your regular class period. You will also be asked to complete a background questionnaire and Instructional Material Motivation Survey.

Total Number of Participants

About 75 English language learners will participate in this study. The study participants will be international students studying at the college level United States.

Alternatives / Voluntary Participation / Withdrawal

Your participation is voluntary. You do not have to participate and may stop your participation at any time. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalties or loss of benefits or opportunities if you do not participate or decide to stop once you start. Your decision to participate will not affect your student status or course grade.

Benefits and Risks

The potential benefits of participating in this research study include learning academic vocabulary and increases your vocabulary knowledge.

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study. However, students are taking physical and online classes and there is inherently no guarantee that the students are not exposed to COVID-19 virus. It is worth mentioning that even without conducting this study the students are taking physical classes and they may be exposed to the virus. The school has tried to sit the students having social distancing and there is a wearing masks policy all over the school. Thus, it is deemed that the risk is minimal and conducting the present study does not incur more risks to the participants.

Compensation

You will receive no payment or other compensation for taking part in this study.

Costs

It will not cost you anything to take part in the study.

Privacy and Confidentiality

Your information and records will be kept private; however, absolute confidentiality cannot be guaranteed. Your personal information may be disclosed if required by law. Certain people may need to see your study records. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government and university employees who need to know more about the study, and individuals who provide oversight to ensure the study is being conducted correctly.
- Any agency of the federal, state, or local government that regulates this research.
- The USF Institutional Review Board (IRB) and related staff who have oversight responsibilities for this study, including staff in USF Research Integrity and Compliance. The details or results of this study may be published. If any portion of this study is published it will not include your name or any personally identifiable information.

If completing an online survey, it is possible, although unlikely, that unauthorized individuals could gain access to your responses. Confidentiality will be maintained to the degree permitted by the technology used. No guarantees can be made regarding the interception of data sent via the Internet. However, your participation in this online survey involves risks similar to a person's everyday use of the Internet. If you complete and submit an anonymous survey and later request

your data be withdrawn, this may or may not be possible as the researcher may be unable to extract anonymous data from the database.

You can get the answers to your questions, concerns, or complaints.

If you have any questions, concerns or complaints about this study, call Principal Investigator, Rabea Alfahad at (813) 607-0294 or contact by email at ralfahad@usf.edu

If you have questions about your rights, complaints, or issues as a person taking part in this study, call the USF IRB at (813) 974-5638 or contact by email at RSCH-IRB@usf.edu.

Consent to Take Part in this Research Study

I freely give my consent to take part in this study. I am 18 years of age or older. I understand that by proceeding with this online tutorial and its survey and tests that I am agreeing to take part in this research.

_____ _____

Signature of Person Taking Part in Study Date

_____

Printed Name of Person Taking Part in Study

Statement of Person Obtaining Informed Consent and Research Authorization

I have carefully explained to the person taking part in the study what he or she can expect from their participation. I confirm that this research subject speaks the language that was used to explain this research and is receiving an informed consent form in their primary language. This research subject has provided legally effective informed consent.

_____ _____

Signature of Person Obtaining Informed Consent Date

_____

Printed Name of Person Obtaining Informed Consent