

The Feasibility of an Innovative Gamified Flipped Classroom Application for University Students in EFL Context: An Account of Autonomous Learning

Kittichai Nilubol¹

¹ Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen, Thailand

Correspondence: Kittichai Nilubol, Faculty of Humanities and Social Sciences, Khon Kaen University, Khon Kaen, Thailand. E-mail: kittni@kku.ac.th

Received: May 29, 2023

Accepted: July 9, 2023

Online Published: July 10, 2023

doi: 10.5539/elt.v16n8p24

URL: <https://doi.org/10.5539/elt.v16n8p24>

Abstract

Aligned with the progress of technology and the availability of online resources, there is a growing inclination to incorporate game elements or gamification into educational settings, particularly in English language classrooms. This mixed methods research endeavors to examine the potential of the Gamified Flipped Classroom Application (GFCA) named “Classcraft” to enhance student’s learning ability, motivation, and autonomy. Questionnaires were employed to explore students’ attitudes towards the utilization of GFCA as an innovative learning tool within the research context. Furthermore, semi-structured interviews were conducted to gain deeper insights into students’ perspectives regarding the use of Classcraft in augmenting their learning motivation and autonomy. The study was carried out with a cohort of 31 Thai EFL students enrolled in English for import and export courses at a public university in northeastern Thailand. The findings revealed that the student’s learning ability exhibited improvement, as evidenced by a higher mean score in the posttest compared to the pretest, subsequent to the implementation of the gamified flipped classroom application in the course. Additionally, a majority of the students expressed a favorable inclination towards the application due to its effectiveness in enhancing their learning motivation, and autonomy and providing an enjoyable and engaging learning experience.

Keywords: gamified flipped classroom application, gamification, autonomous learning, learning

1. Introduction

1.1 Background

Recently, the language classroom has become more technology-oriented which allows students to learn both inside and outside the classroom. To provide students the opportunity to learn more outside of the classroom and prepare the lesson before coming to class, a flipped classroom method has been suggested. The flipped classroom is normally understood as an approach that transfers learning responsibility from teacher to student (Bergman, Overmyer & Willie, 2012). In other words, the flipped classroom allows students to prepare themselves by learning lessons online outside the classroom, therefore, class time can be used for class activities or group discussions.

Moreover, to provide a new learning experience and an opportunity in exploring the subject matter that suits the nature of students in the 21st century. The realm of language acquisition has embraced the utilization of gamification principles in order to cater to the learning preferences of digital natives. Prensky (2001) coined the term “digital natives” to describe students who possess distinct learning styles that are not effectively accommodated by conventional classroom approaches. Consequently, the incorporation of gamification, encompassing the integration of game elements within non-game contexts, offers digital natives the opportunity to engage in autonomous and pleasurable learning environments, thereby fostering enhanced learning outcomes in contrast to the traditional classroom setting.

Several previous studies have demonstrated the potential benefits of incorporating gamification principles within educational settings, leading to improved learning outcomes for students (Brown, 2012; Stanley, 2014). Consequently, this study aims to explore the potential of utilizing gamification techniques to motivate students to dedicate more time to educational pursuits rather than entertainment activities. While existing research in this domain has predominantly focused on how gamification enhances students’ motivation, there is a paucity of

studies examining the impact of gamification on students' learning motivation and autonomy, particularly in Thailand, where internet users have shown a strong preference for game-related activities, such as word searches (Ministry of Information and Communication Technology of Thailand, 2013). By recognizing the advantages of employing gamification in conjunction with the flipped classroom approach, which fosters an enjoyable learning environment along with a sense of challenge and competition, positive learning outcomes can be achieved as students gain greater control over their own learning process. The researchers see the potential of using a gamified flipped classroom in improving students' learning ability and enhance learning motivation and autonomy.

1.2 Statement of the Problems

One of the most significant challenges in English language learning in Thailand pertains to the lack of adequate learning materials, particularly those aligned with students' interests, as indicated by numerous studies (Ministry of Information and Communication Technology of Thailand, 2013). Additionally, Punthumasen (2007) discovered that Thai EFL (English as a Foreign Language) students displayed a lack of interest in learning English due to uninteresting subject matter, uninspiring teaching methodologies in the classroom, and English textbooks and materials that failed to stimulate their motivation to study. This finding aligns with Prapphal's (2007) assertion that language teachers should prioritize classroom activities that integrate technology, web-based projects, or online self-assessments, as technology has the potential to enhance instruction and enhance students' performance.

Indeed, the Ministry of Higher Education, Science, Research and Innovation at the research context encourages lecturers to apply the so-called "Flipped Classroom" approach to enhance students' learning ability. Lecturers can upload learning materials via online platforms, but they also need to use the appropriate learning tools to capture the students' interest and motivation outside of the classroom. In other words, there is no point in setting up a flipped classroom if the learning materials are not different from what is taught in the traditional classroom. This brings about the statement of the problem in this research context, which is how to appropriately use online games in a flipped classroom to improve students' learning motivation and autonomy.

In this current study, the students face boredom when reading the subject matter in PowerPoint slides uploaded in the Google Classroom application. The students were informed to read the slides before each class time, yet they did not enjoy reading the subject matter beforehand. As a result, the delayed class schedule occurred as the researcher had to teach the subject matter again during class time, which was intended to prepare for classroom discussion. In relation to the problem statement mentioned, the researcher would like to investigate the feasibility of the Gamified Flipped classroom Application (GFCA) called "Classcraft" in the English for import and export course in order to encourage the students to study the subject matter in the flipped classroom beforehand.

As a change agent, the researcher proposed the use of Gamified Flipped classroom Application (GFCA) called "Classcraft" to help students improve their learning motivation and autonomy by employing the use of gamification and flipped classroom approach, which provides students an enjoyable learning environment as well as offer more opportunity to learn the language outside the classroom, to increase the positive learning outcome and improve students' learning motivation and autonomy.

In short, one of the most significant challenges in English language learning in Thailand is the lack of adequate learning materials that align with students' interests (Ministry of Information and Communication Technology of Thailand, 2013). Studies have consistently shown that Thai EFL students exhibit a lack of interest in learning English due to uninteresting subject matter, uninspiring teaching methodologies, and textbooks that fail to stimulate their motivation (Punthumasen, 2007; Prapphal, 2007). In response to this issue, the Ministry of Higher Education encourages the implementation of the "Flipped Classroom" approach to enhance students' learning abilities. However, to effectively utilize the flipped classroom, it is crucial to employ appropriate learning tools that capture students' interest and motivation outside of the traditional classroom. Thus, the research problem in this study centers around investigating the appropriate utilization of online games in a flipped classroom to improve students' learning motivation and autonomy.

1.3 Research Purpose

This study aims to:

- (1) Examine the roles of the Gamified Flipped Classroom Application elements on students' learning motivation and autonomy.
- (2) Investigate the effects of the use of Gamified Flipped Classroom Application in English for import and export courses.

(3) Explore the students' attitudes towards the use of Gamified Flipped Classroom Application on their autonomous learning skill.

To achieve the study purposes stated above and to provide essential knowledge about the issues as described before, several research questions are posed. This current investigative study seeks to answer the below questions.

(1) What are the roles of the Gamified Flipped Classroom Application elements on students' learning motivation and autonomy?

(2) What are the effects of the use of Gamified Flipped Classroom Application in English for import and export courses?

(3) What are the students' attitudes towards the use of Gamified Flipped Classroom Application on their autonomous learning skill?

The three research questions are interconnected, as they collectively contribute to addressing the research problem. By examining the roles of GFCA elements (question 1), evaluating the effects within the context of English for import and export courses (question 2), and understanding students' attitudes and autonomous learning skills (question 3), this study aims to provide a comprehensive analysis of the GFCA's impact on students' learning motivation and autonomy.

The investigation of these research questions will provide valuable insights into the potential of the GFCA to enhance students' learning experiences, improve their motivation, and foster their autonomy in English language learning. By establishing a clear connection among the research questions and the research problem, this study aims to contribute to the body of knowledge on effective strategies for addressing the challenges of English language learning in Thailand.

2. Literature Review

2.1 Gamification

Gamification entails the integration of game-based elements, such as game mechanics and dynamics, within non-game contexts, creating an environment characterized by playfulness (Burke, 2014). By incorporating game mechanics, aesthetics, and game thinking into educational settings, gamification has the potential to effectively engage individuals, foster motivation and action, and facilitate learning and problem-solving (Kapp, 2012). Moreover, the inclusion of role-playing within gamification allows students to actively interact and assume control over their learning experiences, thereby potentially leading to improved learning outcomes (Danowska-Florczyk & Mostowski, 2012; Wichadee & Pattanapichet, 2018). In essence, the application of gamification techniques enables students to navigate through typically monotonous tasks, increasing their engagement and involvement in the classroom.

When implemented effectively in the classroom, gamification holds promise for transformative educational experiences, resulting in changes in learning behaviors. The One Computer Classroom (OCC) initiative, initiated by the Primary Education Service Office in Thailand in 2013, aimed to explore teachers' needs and innovative pedagogies. The findings underscored the importance of empowering students and fostering autonomous learning, as students demonstrate optimal learning outcomes when they have control over their learning process. Consequently, the integration of game elements or gamification in instructional activities emerges as a compelling avenue for educators to facilitate students' autonomy and engagement in learning.

There is a growing trend towards combining gamification and flipped classrooms in language learning, each approach presenting distinct advantages and limitations. Acknowledging this, the researcher undertook the development of a novel method termed a "gamified flipped classroom" which synergistically incorporates these elements. In this study, a gamified flipped classroom application was employed to support both in-class and out-of-class activities, promoting the acquisition of English vocabulary. By infusing the application with gamified elements, a sense of playfulness was cultivated, thereby enhancing students' learning experiences (Kapp, 2012).

2.2 Flipped Classroom

With the growing prevalence of the Internet and technology, the Ministry of Education of Thailand has endorsed the implementation of a flipped-classroom approach to enhance student learning (Ministry of Information and Communication Technology of Thailand, 2013). In a flipped classroom, the traditional in-class activities are assigned as homework, while classroom time is devoted to the application and reinforcement of knowledge (Bergmann and Sams, 2012, p. 13). By combining well-designed materials with the flipped-classroom model,

students are empowered to choose alternative learning methods aligned with their interests, thereby fostering creative thinking. Furthermore, flipped classrooms facilitate the transfer of knowledge outside the classroom, as students can review and practice lesson materials prior to class, thereby assuming control over their own learning process.

Numerous researchers have integrated the flipped-classroom approach into their teaching practices, with positive outcomes reported for student learning. The model also encourages autonomous learning by allowing students to learn at their own pace, anytime and anywhere. Schmitt (2000) suggests that classroom teaching is not the sole effective method for vocabulary instruction, and assigning vocabulary-related homework tasks can be a more productive approach for students. Through these assignments, students have the opportunity to engage with new lesson content on their own. When students attend class, the teacher can then elaborate, clarify, and consolidate the lesson through various classroom activities. With the students already familiar with the lesson content through pre-class preparation, teachers have more time for interactive in-class exercises, collaborative learning, or game-based activities. Such approaches shift students from passive recipients, who merely listen to lectures, to active learners. As students have already explored the concepts and content before class, the focus during class time can shift towards asking questions, participating in class activities, and engaging in group discussions, thereby further enhancing student engagement in the learning process.

2.3 Theoretical Framework

2.3.1 Learning Motivation

In recent years, there has been a growing effort to incorporate technology, particularly games, into educational settings. Games in education and the concept of gamification provide students with opportunities to learn in engaging, effective, and creative environments. The integration of gamification offers the potential for positive learning outcomes. The importance of entertainment and motivation in gameplay has been highlighted in research conducted by Malone (1981), who sought to understand the reasons behind the enjoyment and motivation derived from games. Based on his findings, Malone proposed three key elements that contribute to the motivational aspect of games: challenge, fantasy, and curiosity.

The challenge in games is contingent upon the presence of goals with uncertain outcomes. Games should include elements such as challenging levels, multiple objectives, hidden information, and randomness to introduce uncertain outcomes. Fantasy refers to the game environment that stimulates mental imagery of elements not present in everyday reality. The incorporation of fantasy elements in instructional environments can enhance interest and provide cognitive and emotional benefits. The cognitive advantage of utilizing fantasy lies in students' ability to apply new knowledge in understanding novel concepts, while the emotional advantage arises from the satisfaction derived from game-playing experiences. Curiosity is another important element that can engage students in exciting environments. Sensory curiosity, such as captivating visuals or captivating sounds, has a significant impact on attracting students' attention. Additionally, cognitive curiosity arises when games prompt students to recognize gaps in their knowledge and stimulate a desire to learn more by modifying their higher-level cognitive structures.

In summary, the integration of games and gamification in education creates entertaining and motivational learning environments. Games offer challenges, fantasy elements, and opportunities for curiosity, which contribute to enhanced engagement and learning outcomes for students.

2.3.2 Operant Conditioning

Operant conditioning, introduced by Skinner in the 1930s, is a method of motivating individuals through external reinforcement. In the context of games, maintaining player engagement over an extended period requires the implementation of a variable ratio reinforcement schedule or reward schedule. Four types of reward schedules are commonly used in games:

- (1) Variable ratio (VR): This schedule involves providing reinforcement for behavior at unpredictable intervals. For example, in a game, players may receive a gold coin when they hit a mushroom, but the occurrence of this reward is not consistent.
- (2) Fixed ratio (FR): Under this schedule, reinforcement is provided after a predetermined number of times a behavior is exhibited. Players are aware that they will receive an award or power-up if they collect a certain number of coins, tokens, or points.
- (3) Fixed interval (FI): Reinforcement is given for behavior after a fixed amount of time has passed. For instance, in a game, a magic shield may appear every fifteen minutes after being destroyed. As players wait for the shield to reappear, they may explore other aspects of the game more rapidly, anticipating its reappearance.

(4) Variable interval (VI): This schedule involves providing reinforcement for behavior after a variable amount of time has elapsed, but the time intervals are not fixed. For example, a magic umbrella in a game may appear every minute, then every two minutes, and later every five minutes.

The application of these reward schedules in games helps maintain player engagement by creating an element of unpredictability and anticipation. Players are motivated to continue their actions and interactions within the game in order to receive rewards. The below table shows theories adapted from "The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education" by Karl M. Kapp (2012).

2.3.3 Self-Determination Theory

The Self-Determination Theory (SDT) provides insight into how individuals engage in activities within games. SDT comprises three key elements: autonomy, competence, and relatedness. Autonomy refers to the perception of being in control and having the ability to determine the outcomes of one's actions. Competence relates to the need for challenging tasks that allow individuals to develop mastery of specific actions. Relatedness pertains to the sense of connection with others, particularly when playing games with friends or fellow players.

This study aims to demonstrate the reciprocal relationship between SDT and gameplay. Players experience autonomy as they take control of their actions within the game. The competitive nature of gameplay, aimed at achieving goals, and the sense of relatedness with other players contribute to the cultivation of motivation. Consequently, game autonomy, competence, and relatedness are associated with the enjoyment of games, individual preferences, and overall well-being. In summary, the study emphasizes the interplay between SDT and gameplay, highlighting the significance of autonomy, competence, and relatedness in shaping motivation and overall experiences within the game.

2.3.4 Distributed Practice

Distributed practice, in the context of gameplay, refers to the practice of players returning to replay a game in order to achieve higher scores. This technique involves spreading out study and learning efforts over multiple short sessions. The primary focus is on the subject matter that needs to be learned. According to research conducted by Howard-Jones and Demetrio (2008), a distributed practice strongly supports learning by enhancing the retention and recall of memorized information over the long term.

In the game context, this implies that the design of the game experience incorporates distributed practice as players are encouraged to play the game repeatedly. The inclusion of varying storylines within the game aids in player retention and facilitates more effective long-term learning and recall of the acquired knowledge. In short, distributed practice in gameplay involves players returning to replay the game, leading to improved learning outcomes. By incorporating varying storylines, games can enhance player retention and the long-term recall of the acquired knowledge.

In summary, the theoretical framework employed in this study incorporates several key theories and concepts to create a comprehensive understanding of how games and gamification can enhance learning motivation, engagement, and overall learning outcomes. The integration of Learning Motivation theory emphasizes the importance of incorporating challenging goals, fantasy elements, and opportunities for curiosity within educational games to create engaging and motivational learning environments. Operant Conditioning theory highlights the use of variable reinforcement schedules to maintain player engagement through unpredictable rewards. Self-Determination Theory (SDT) underscores the significance of autonomy, competence, and relatedness in shaping players' motivation and experiences within the game, emphasizing the reciprocal relationship between motivation and gameplay. Additionally, the concept of Distributed Practice promotes repeated gameplay sessions, aided by varying storylines, to enhance learning outcomes and long-term retention. By combining these theories and frameworks, the study aims to provide insights into creating effective game-based educational experiences that foster learning motivation, engagement, and overall learning outcomes.

3. Methodology

3.1 Research Design

This study employs a sequential explanatory mixed methods research design, combining quantitative and qualitative methodologies to comprehensively address the research questions (Dörnyei, 2003). The integration of these approaches aims to enhance the understanding of the roles, effects, and attitudes towards the Gamified Flipped Classroom Application in the context of learning motivation, autonomy, and English for import and export courses. The emphasis is primarily on quantitative data, supported by qualitative data for triangulation purposes (Kelle, 2006). Quantitative measures such as surveys, questionnaires, and pre-and post-tests will be used to gather numerical data on students' motivation, autonomy, language proficiency, and learning outcomes.

Statistical analysis techniques will be applied to explore relationships, significance, and changes. Qualitative methods including interviews and observations will provide deeper insights into students' perceptions, experiences, and challenges. The research design ensures a comprehensive exploration, validity, and reliability of the findings, contributing to a better understanding of the Gamified Flipped Classroom Application's impact on learning motivation, autonomy, and English language learning in import and export courses.

3.2 Instrumentation

This study employed four research instruments to examine the effectiveness of gamified flipped classroom applications in enhancing students' learning motivation, autonomy, and attitudes towards English for import and export courses. The research instruments consisted of the following:

- (1) Gamified Flipped Classroom Application (GFCA): A custom-designed application created by the researcher specifically for students enrolled in English for import and export courses. This application incorporated gamification techniques and elements to make learning activities more enjoyable and engaging. The concepts and game designs from the "Classcraft" application served as the basis for this instrument.
- (2) Pre-Posttest: Chapter tests were conducted before and after each unit lecture to assess student's learning progress and knowledge retention.
- (3) Questionnaire: Administered to all participants to gather data on their attitudes towards the use of the GFCA in their lessons.
- (4) Semi-Structured Interview: Conducted to explore how the GFCA impacted participants' learning ability, as well as their motivation and autonomy in the learning process.

The research design for this study, as mentioned earlier, is a sequential explanatory mixed methods approach, combining quantitative and qualitative methodologies to comprehensively address the research questions. The emphasis is primarily on quantitative data, supported by qualitative data for triangulation. The first research question focuses on the roles of Gamified Flipped Classroom Application elements on students' learning motivation and autonomy. Quantitative data collection methods, such as surveys and questionnaires, will be used to gather numerical data, while qualitative data will provide deeper insights through interviews and focus group discussions. The second research question explores the effects of the application in English for import and export courses. Quantitative measures, including pre-and post-tests, will assess language proficiency and learning outcomes, supplemented by qualitative methods such as observations and interviews. The third research question examines students' attitudes towards the application's impact on their autonomous learning skills, utilizing both quantitative measures like surveys and qualitative approaches such as interviews and open-ended questions. The research design ensures a comprehensive exploration of the research questions, enhancing the validity and reliability of the findings and contributing to a better understanding of the Gamified Flipped Classroom Application in the context of learning motivation, autonomy, and English language education for import and export courses.

To ensure the validity and usefulness of the data collected through these research instruments, they were subjected to expert evaluation. Three experts in the field, both internal and external to the study, were provided with the research instruments. The researcher employed the index of item-objective congruence (IOC) process, seeking feedback and suggestions directly from the experts to enhance the validity and reliability of the research instruments. Additionally, the interview protocols were translated into Thai to accommodate participants who might feel more comfortable expressing themselves in their native language. This linguistic adaptation facilitated clearer and more accurate responses. Feedback from a pilot study was also considered to improve the validity of data collection, enhancing the overall validity and reliability of the research instruments and data collection methods.

3.3 Data Collection Procedure

In collecting the data, the researcher employed the Equivalent Time Sample design since the researcher had no comparison group or control group due to the limited time. The researcher spent six weeks collecting the data. For every other week of the six weeks (week 2,4,6), the researcher provided the Gamified Flipped Classroom Application (GFCA) called "Classcraft" which the participants would study that week. Meanwhile, the researcher simply provides PowerPoint slides containing the subject matter for which to learn in the alternative weeks (week 1,3,5). To be more specific, the researcher collects the data every week. The odd number weeks as pre-test scores, and the even number weeks as post-test scores. Moreover, the reason why the researcher chose to study the participants in the same section was simply that the researcher could be sure that all participants had equal learning abilities, and this enhanced the reliability of the research results. The below diagram helps you see

how the data collection works.

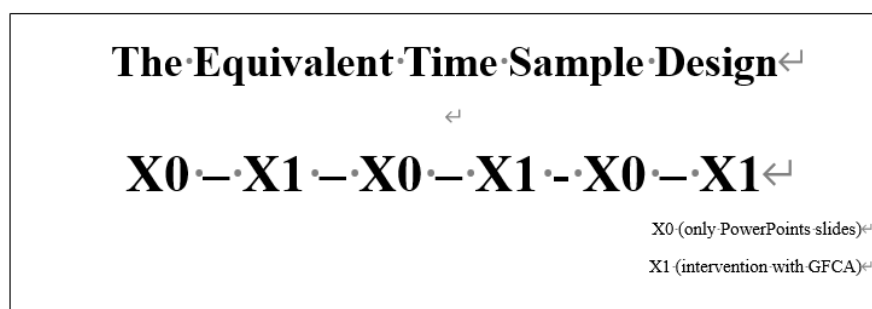


Figure 1. Data collection procedure in six weeks

The data collection procedure can be illustrated more clearly according to the following steps, firstly, the researcher conducted a normal classroom activity with the students in the first week of the course. Then the researcher had all participants take a chapter test as a pre-test Week 1,3, and 5. Next, the gamified flipped classroom application (GFCA) was introduced to students. After that, the data collection was executed followed by the six weeks plan of the experimental period. The researcher conducted the posttest with the students at the end of Week 2,4, and 6. Later, the participants were given a questionnaire asking about their attitudes towards the use of GFCA in the course, and the interview was held to gain more in-depth information about the attitudes towards the use of GFCA in enhancing the participants' learning ability as well as learning motivation and autonomy. Below is the data collection procedure for each week.

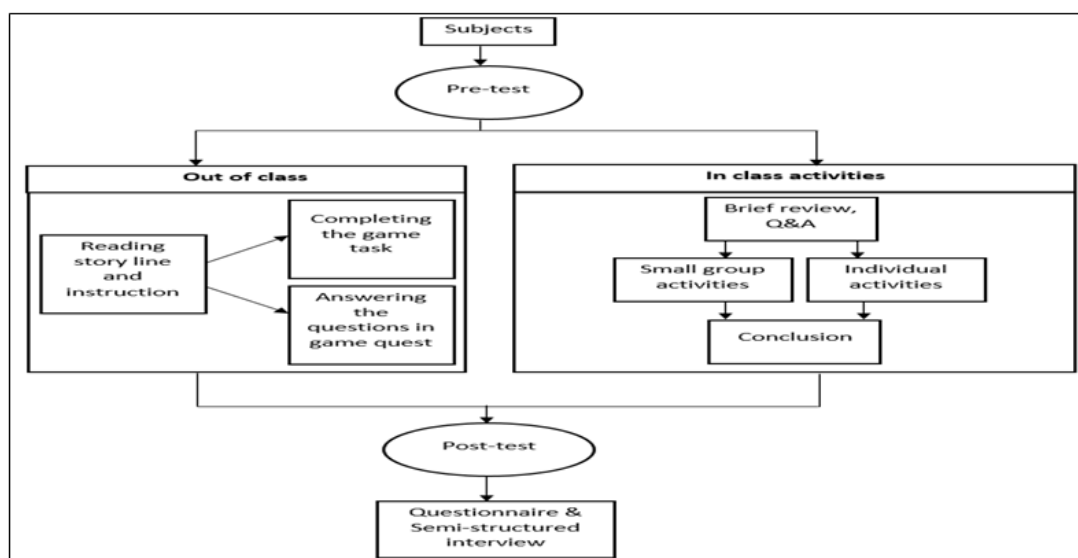


Figure 2.

3.4 Data Analysis

Along with the description of subjects, give the mended size of the sample and the number of individuals meant to be in each condition if separate conditions were used. State whether the achieved sample differed in known ways from the target population. Conclusions and interpretations should not go beyond what the sample would warrant.

3.4.1 SPSS Programme

The collected data were subjected to analysis using the Statistical Package of Social Sciences (SPSS). The T-test was employed to examine the differences between pre-test and post-test scores, providing insights into the progress made by the participants. For the analysis of the questionnaires, Microsoft Excel was utilized to calculate the mean (x) and standard deviation (S.D.) values. Additionally, SPSS, specifically designed for statistical analysis, was utilized to analyze the statistical data derived from the questionnaires administered to all participants. The utilization of graphs and charts aided in presenting a clear visual representation of the study's findings, complementing the numerical data. This was advantageous as specialized statistical software, such as

SPSS, facilitates the generation of graphical representations, whereas general software programs may focus on other functions like invoicing and accounting forms (Benefit of SPSS, n.d.).

3.4.2 Coding

The analysis of the interview data involved several steps to derive meaningful insights from the gathered transcripts. The researcher employed a coding process, which encompassed three main steps: open coding, axial coding, and selective coding. The following describes each step in detail:

(1) Open coding: Initially, the researcher engaged in the repeated reading of the semi-structured interview transcripts. During this process, specific markers of different colors were used to highlight sentences or segments that were conceptually related or exhibited common themes. The purpose was to identify and label the key ideas and concepts expressed by the participants.

(2) Axial coding: In the second step, the researcher organized the colored sentences or segments into groups based on the research questions and their thematic relationships. By considering the connections and interrelationships among the highlighted sentences, the researcher categorized them under relevant themes or concepts. This step aimed to identify patterns and associations within the data.

(3) Selective coding: After categorizing the colored sentences into different thematic groups, the researcher gathered and refined the data within each category. The aim was to develop theoretical themes by examining the relationships and connections among the collected data. The researcher carefully analyzed the chunks of data within each category to extract overarching themes and concepts that emerged from the participants' explanations.

Throughout the coding process, the researcher engaged in repeated comparisons of the transcript gathered from the semi-structured interview, revisions, and modifications to ensure the validity of the categories and themes. This iterative process helped validate the coding structure and refine the interpretations of the data. The guidelines provided by Patton (2002) were followed as a reference for conducting the analysis of the interview data.

3.5 Ethical Consideration

According to McNamara (1994), there are five ethical concerns that should be taken into account during the research process. These guidelines primarily focus on voluntary participation and include the following aspects: (1) ensuring voluntary participation, (2) avoiding harm to respondents, (3) maintaining anonymity and confidentiality, (4) providing information about the purpose and sponsor of the research, and (5) conducting proper analysis and reporting of the findings. Each of these ethical concerns will be individually addressed in this study to address and mitigate any potential ethical issues.

In this current study, three ethical concerns were specifically considered. Firstly, it was essential to guarantee that participation in the research was entirely voluntary and that potential participants felt comfortable and willing to take part. To address this, a consent form was developed and distributed before data collection commenced, allowing individuals to express their willingness to participate in the research.

Secondly, preventing harm to the respondents was of utmost importance. Consequently, the research design avoided including questions that could potentially cause embarrassment or discomfort. Sensitivity towards participants' well-being extended beyond the data collection phase and encompassed the data analysis process and survey results. To mitigate any potential harm, confidentiality measures were discussed, and careful report writing was employed.

Lastly, protecting the identity of the respondents was a critical ethical consideration. Anonymity and confidentiality were employed as safeguards. An anonymous survey or interview ensures that respondents cannot be identified based on their responses (McNamara, 1994). To address this ethical concern, the consent form explicitly stated that survey and interview responses would be treated as confidential, and participants' identities would be protected. Participants' information was kept confidential and solely used for follow-up purposes.

By addressing these ethical concerns related to voluntary participation, avoiding harm, and maintaining anonymity and confidentiality, this study ensured that ethical guidelines were followed and that participants' rights and well-being were upheld during the research process (McNamara, 1994).

4. Results

In order to fulfill the objectives of the study and contribute valuable insights into the identified issues, several research questions have been formulated. The current investigation aims to address the following research questions:

- (1) What are the roles of the Gamified Flipped Classroom Application elements on students' learning motivation and autonomy?
- (2) What are the effects of the use of Gamified Flipped Classroom Application in English for import and export course?
- (3) What are the students' attitudes towards the use of Gamified Flipped Classroom Application on their autonomous learning skill?

By addressing these research questions, the study aims to provide essential knowledge and contribute to the understanding of the identified issues. The subsequent sections will present the findings and analysis that address these research questions, thereby shedding light on the research objectives of the study.

4.1 What are the Roles of the Gamified Flipped Classroom Application Elements on Students' Learning Motivation and Autonomy?

The Gamified Flipped Classroom Application (GFCA) was developed for the English for import and export course, where students learned and explored the subject matter online through a flipped classroom. The activities in GFCA were developed by the researcher based on learning theory and game elements as shown in Table 1.

Table 1. Elements of GFC

Learning Theory	Impact on Gamification Design	Activities of the GFCA
Malone's Theory of Intrinsically Motivating Instruction	The inclusion of challenge, fantasy, and curiosity within gaming experiences has the potential to significantly enhance students' intrinsic motivation towards the process of learning.	Game feed and Avatar
The Taxonomy of Intrinsic Motivations for Learning	The incorporation of challenge, curiosity, control, fantasy, cooperation, competition, and recognition as elements within gaming environments holds the capacity to stimulate and bolster both the internal and external motivational aspects of students.	
Operant Conditioning	To sustain learners' interest effectively, it is advisable to implement suitable rewards, points, and badges in a dynamic and variable manner.	Treasure box
Self-determination Theory	It is recommended to offer learners ample opportunities for autonomy, fostering a sense of competence, and promoting a feeling of relatedness with others.	Avatar
Distributed Practice	In order to facilitate effective learning, the game should be designed to unfold gradually over time, allowing for spaced repetition of the content within the game.	Mission & Quest

The research findings revealed strong evidence supporting the effectiveness of the GFCA (gamified flipped classroom application) in enhancing students' learning ability, motivation, and autonomy. The survey conducted with students clearly indicated that the GFCA served as a highly suitable method for improving their learning outcomes and fostering a sense of autonomy. The integration of engaging and enjoyable activities within the GFCA played a crucial role in promoting students' exploration of the subject matter, resulting in improved learning performance.

The evaluation process implemented in the study further substantiated the positive impact of the GFCA. Both formative and summative assessments were employed to assess students' progress and overall achievement of learning goals. The formative evaluation, through the "Boss Battle" activity, allowed teachers to closely monitor students' performance and comprehension using targeted vocabulary questions. On the other hand, the summative evaluation conducted at the conclusion of the course provided a comprehensive assessment of students' overall learning outcomes.

The research findings align with previous studies, such as the work by Gee (2012), emphasizing the efficacy of digital

game-based approaches with relevant features in supporting language learning and acquisition. The intentional design features and implementation strategies of the GFCA played a pivotal role in facilitating the observed improvements in students' learning ability. This robust evidence highlights the significant contribution of the GFCA in enhancing students' learning outcomes, motivation, and autonomy.

In summary, the research findings substantiate the effectiveness of the GFCA as a powerful tool for promoting students' learning ability, motivation, and autonomy. The integration of engaging activities within the GFCA, supported by both formative and summative assessments, resulted in improved learning performance. These findings contribute to the growing body of research highlighting the positive impact of gamified flipped classroom approaches on student learning outcomes and provide valuable insights for educators seeking innovative and effective instructional methods.

4.2 What are the Effects of the Use of Gamified Flipped Classroom Application in the English for Import and Export Course?

After learning with a gamified flipped classroom application, students' chapter test score improved as shown in Table 3.

Table 2. Comparing students' pretest and posttest scores

Variables	Mean	S.D.
Pre –test	11.76	3.865
Post-test	16	4.537

Table 3. Students' chapter test scores (Pretest & Posttest)

		Paired Differences					df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	posttest pretest	-4.24000	4.19603	.83921	2.50796	5.97204	5.052 24	.000

Table 1 shows that 31 students in this class completed both pretest and posttest. The total score of each test was 25. Before learning with a gamified flipped classroom application students got the pretest score at 11.76 out of 25. However, after learning the subject matter with the gamified flipped classroom application for 6 weeks students performed better in the posttest. The mean score of the posttest was increased from the pretest score at 4.24.

According to Table 2, the difference between the mean score of pretest and posttest was 4.24 and the p-value is lower than 0.05. Therefore, there was a statistically significant difference between the pretest and posttest mean scores. It can be concluded that there were positive effects on the use of gamified flipped classroom applications because it can help students improve their learning ability.

Table 1 presents the data for a class of 31 students who completed both the pretest and posttest assessments. Each test had a maximum score of 25. Prior to engaging with the gamified flipped classroom application, students achieved an average score of 11.76 out of 25 on the pretest. However, after a 6-week period of learning with the gamified flipped classroom application, students demonstrated improved performance on the posttest. The mean score for the posttest increased by 4.24 points compared to the pretest score.

In Table 2, the analysis reveals a statistically significant difference between the mean scores of the pretest and posttest, with a difference of 4.24 points. The p-value associated with this difference is lower than the predetermined significance level of 0.05. Based on these findings, it can be concluded that the use of gamified flipped classroom applications has a positive effect on students' learning ability, as evidenced by their improved performance on the posttest.

These results indicate that the implementation of the gamified flipped classroom approach has yielded significant benefits in enhancing students' learning outcomes. The use of interactive and engaging elements in the application has effectively contributed to the improvement of students' learning ability in the subject matter under study.

4.3 What are the Students' Attitudes towards the Use of Gamified Flipped Classroom Application on their Autonomous Learning Skill?

The questionnaires were administered to the students to explore their attitudes about using a gamified flipped classroom application in the English for import and export course. The results from the questionnaires were reported as follows. Firstly, 86.4% of the students strongly agree with item six and item eight ($\bar{x} = 4.32$). It indicated that students had good attitudes towards learning the subject matter with a gamified flipped classroom application. Secondly, 85.6% of the students strongly agreed with item five ($\bar{x} = 4.28$). This showed that students had good attitudes towards their learning ability as well as learning motivation and autonomy with a gamified flipped classroom application because it gives them a chance to learn more outside the classroom. Thirdly, 83.2 % of students agreed with item nine ($\bar{x} = 4.16$). This indicated that students had good attitudes towards learning with a gamified flipped classroom application because it was more motivated compared to the normal classroom.

The following themes emerged from the semi-structured interviews, consisting of positive learning outcomes, enjoyable learning experiences, and recommendations for improvement.

4.3.1 Positive Learning Outcomes

Based on students' responses, gamified flipped classroom application improved their learning motivation by completing mission and quest on-line. This was the most frequently reported responses. The quest and mission in-game helped them improved their learning ability by practicing and reviewing the subject matter learned from the lesson. The following statement illustrates the point

"I really like to complete the quest because typing the answer can help me remember vocabulary more" (S5).

Another student mentioned that

"To earn points, I need to find the correct answer by searching for the meaning of all choices before submitting and I think this helps me to remember the vocabulary" (S2)

4.3.2 Pleasure Learning Experience

Students pointed out that gamified flipped classroom provided a pleasurable learning experience. Students reported that level up the avatar in-game is fun and motivated to learn more, they can learn the lesson online through mobile devices anywhere anytime and it is more convenient than learning from books. Exemplified as follows:

"I don't want to lose my friend, I want my avatar to be at the higher level so I need to study harder to answer correctly" (S10)

One student also added that

"I like learning with this [gamified flipped classroom application] a lot because it is fun and easy, I can learn vocabulary at home or even on the bus" (S8)

4.3.3 Recommendations for Improvement

Though students reported that using a gamified flipped classroom application to explore the lessons is easy and convenient; some of them mentioned in the interview that some features took lots of time in loading. As one student added that

"When I complete each question in a quest, it took me few minutes for loading to the next question, I think if you can put all questions in one page it might be easier for us" (S12)

5. Discussion

5.1 Using a Gamified Flipped Classroom Application in an Account of Learning Autonomy

The quantitative results of students' attitudes showed that students responded to the questionnaires with overall positive opinions. The engagement that student experienced in-game and education context help in increasing their knowledge (Kapp, 2012). Moreover, elements associated with games such as fantasy, curiosity, and competition can highly raise students' learning motivation and autonomy. Students found that learning with a gamified flipped classroom application was fun and entertaining because this application allowed students to think about what they usually consider boring to become more interesting. These results were supported by the study of Shatz (2015), who found that gamification can be used to promote students' vocabulary learning. As a player, students were engaged in a target language and gain some knowledge unconsciously.

Additionally, the gamified flipped classroom application can promote their autonomous learning skill that

appeared to receive the most positive feedback from students. Since the students can learn the lesson online, they can prepare themselves before coming to class. Therefore, more class time can be devoted to face-to-face activities such as correcting their misunderstandings or increasing participation in discussions. The results were similar to Cooke and Tohei (2015) conducted a study by employing a flipped classroom in EFL writing class. They found that students favored the ability to access the online lesson because learning the content before coming to class makes them feel more confident about discussing in class.

Nevertheless, there are some negative opinions showed up while interviewing. Students mentioned the difficulties they found in using a gamified flipped classroom application. Students added that while playing the game, it took a lot of time to load the next page. In response to this problem, the researcher would consider suggesting students change their internet connection from Wi-Fi to a personal data internet package that is more stable than University Wi-Fi. Moreover, the researcher might consider editing some of the game features to put all questions together on the same page according to students' suggestions.

5.2 Using a Gamified Flipped Classroom Application in an Account of Attributes of Innovations

Moving back to the statement of the problem the researcher mentioned at the beginning of this current study, the participants at the research site were facing boredom in preparing and studying in their old traditional teaching approach: reading PowerPoint slides, and reviewing the subject matter in the textbook. As a result, the researcher decided to adapt the innovative Gamified Flipped Classroom Application (GFCA) called "Classcraft" to enhance students' learning quality as well as improve learning motivation and autonomy. It is the case that innovation of one particular context may not be considered as innovative practice in some other contexts. Despite the diffusion of using gamification in English language teaching (ELT) these days, the GFCA was introduced for the first time in this research context.

In relation to Markee (1992), he explains important reasons why a change agent decides to adapt and innovate in his context. He points out five crucial attributes of innovation in the diffusion of innovation in language teaching. The five attributes were in line with the reasons why the researcher decided to adapt the innovative Gamified Flipped Classroom Application (GFCA) in this study. Firstly, the researcher used the GFCA in the classroom because of the relative advantage to potential adopters of adopting the Classcraft. To be more specific, the Classcraft application is a free-download application; hence, students have no need to pay for their new interesting learning.

Next, the compatibility of the innovation with previous practice was another important issue to be considered. In this study, this GFCA was different from what the researcher has implemented in the classroom; thus, it took quite a while for the preliminary study as well as the piloting of the innovation. The good thing was that all participants got used to playing online games especially the female. However, what if the students do not enjoy playing games: this is quite challenging for the change agent to prepare alternative activities which fit with students' interest.

The third reason is the complexity of the innovation. In the first place, the researcher was worried about how difficult it was when the researcher had to set all Classcraft elements. Unlike other online games, the Classcraft elements were easy and simple to set up all quests and missions in the application. Thus, the researcher could easily decide to use Classcraft as a teaching tool in the course.

As mentioned, the GFCA garnered interest among all participants; all of them enjoy learning and playing by themselves at any time of their convenience. Hence, the trialability of the innovation was positive. Yet, if there was more difficulty in the implementation process, the researcher or other change agents might not want to use it over the course.

Last and foremost, the researcher put more emphasis on the observability of the innovation as it is the most empirical evidence to confirm the successful implementation of an innovation. In this study, the research results illustrate the successful implementation of the GFCA in the English for Important and Export course. The participants could observe their higher chapter test scores once they were provided with the GFCA in weeks 2, 4, and 6. More importantly, the participants shared their experience with the other friends and some of their lecturers; in doing so, it provides an opportunity for the researcher to invite other change agents to use the GFCA in their courses.

6. Implication

Based on the empirical findings derived from this ongoing inquiry, there exist a variety of viable methodologies that can effectively enhance students' cognitive proficiency, as well as their inclination towards and autonomy in the learning process within the designated research environment. The researcher intends to propose a set of

ramifications pertaining to the outcomes of this study, thereby offering a more lucid comprehension of actionable measures and, significantly, delineating the precise strategies by which this innovative approach can be efficaciously executed.

6.1 Implications for Course Developer

The meticulous development of the Gamified Flipped Classroom Application (GFCA) model entailed a systematic process wherein the design of the tool played a pivotal role in its attainment of the desired educational objectives. Consequently, the course developer must exercise careful deliberation in selecting the learning theories to be employed as well as the instructional materials to be utilized, with the aim of effectively addressing the diverse needs and interests of the students. In the present investigation, the GFCA was meticulously constructed by incorporating elements of gamification and the flipped classroom approach. To facilitate the management of lessons and activities within an online platform, the features of the Classcraft application were harnessed. The preliminary findings of the study revealed a noteworthy level of participant engagement with the online game. As previously highlighted, it is of utmost significance to choose tools that align appropriately with the specific context of the course.

6.2 Pedagogical Implication

GFCA was considered a good learning tool for enhancing students' learning ability as well as learning motivation and autonomy at the research site. Instructors, who are seeking an innovative teaching approach to their course, may consider GFCA as an alternative practice for their lessons. Moreover, this study has shown that GFCA helps motivates students to learn and engage with the subject matter in the flipped classroom. In other words, the students enjoy learning by themselves anywhere and any time of their convenience. Furthermore, the accessibility of the subject matter in the flipped classroom before participating in class time also plays an important role in improving students' learning motivation and autonomy. Consequently, the implementation of the GFCA should be considered in other courses as a valuable approach to assist students in comprehensively grasping and assimilating the fundamental knowledge pertaining to specific lessons prior to attending classroom sessions. Within the context of this study, the researcher has devised a series of exercises and quizzes referred to as Missions and Quests, respectively, with the explicit objective of ensuring that effective learning takes place prior to the scheduled class sessions.

However, implementing a flipped classroom should consider internet accessibility. It is inarguable to state that not all students can access the internet at any time of their convenience, yet they have a smartphone or a laptop. More importantly, teaching by the gamification method may not always be successful with all students since not all students relish using games as their learning tool. It is crucial to investigate students' individual differences to see if your innovative teaching approach fits all students' needs and interests. This is one of the most challenging parts for English Language Teaching (ELT) practitioners in teaching in the digital disruption era. Hence, the second and the third plans should be prepared for those students who have no interest in gamification; an "equally interesting" alternative tool should be provided to ensure that all students have their preferred learning options in their flipped classroom. At the research site, the preliminary study showed that not only all participants are able to access the internet, but they also enjoy playing online games. As a result, the Gamified Flipped Classroom Application (GFCA) helps improve students' learning ability as well as enhance students' learning motivation and autonomy.

6.3 Implications for Further Study

The findings of this study demonstrated notable enhancements in students' learning ability, motivation, and autonomy when utilizing the GFCA within the English for Import and Export course. Additionally, the students displayed a favorable attitude towards the incorporation of GFCA as a learning tool. However, valuable suggestions were provided by the students, highlighting certain areas of improvement that could be addressed should GFCA be implemented in other courses. Therefore, there exists an opportunity for further investigation in this area. For instance, the researcher could explore the application of different learning theories to develop activities that support student learning. Furthermore, the researcher might consider investigating the efficacy of GFCA in diverse contexts, subject areas, or other aspects of English language proficiency. Such endeavors would contribute to a deeper understanding of the potential benefits and limitations of GFCA in various educational settings.

7. Conclusion and Recommendation

The findings of the current study were consistent with other previous studies, and they suggest that the Gamified Flipped Classroom Application GFCA can be considered as an innovative teaching and learning tool for improving students' learning ability as well as learning motivation and autonomy. More than that, the findings demonstrate a more specific explanation regarding how gamification and flipped classroom implementation

could support students' learning achievement. Not only did the participants get higher chapter test scores, but they also enjoy learning the subject matter of the English for import and export course via the Classcraft application in the flipped classroom. By doing so, these kinds of feelings drove both the internal and external motivation of the participants to play and learn more (Kapp, 2012). Further, playing several quests in the game facilitates more opportunities for the participants to learn and better their learning autonomy skills (Reinders & Wattana, 2014).

Even though we are in the digital era, internet accessibility poses a challenge when using technology in the classroom. This study warns that implementing a flipped classroom should take internet accessibility into consideration. It is inarguable to state that not all students can access the internet at any time of their convenience, yet they have a smartphone or a laptop. One more thing, teaching by gamification method may not always be successful to all students since not all students relish using games as their learning tool.

Based on the limitations and findings of the present study, the following suggestions are put forward for consideration in future research:

(1) The study's outcomes highlighted the positive impact of GFCA on students' learning ability and autonomy in the context of English language acquisition. To expand upon these findings, it is recommended to develop GFCA further to enhance learners' other skill sets or explore its application in different courses.

(2) This research was conducted solely within one university, which may restrict the breadth and depth of insights due to the limited number of participants and the specific research context. Therefore, future investigations should strive for greater effectiveness by incorporating multiple universities in their study design.

(3) Consideration should be given to randomization techniques to ensure the research findings can be more reliably generalized to a wider population. This would enhance the validity and reliability of the research outcomes, enabling the conclusions and insights derived from the study to be applied with greater confidence across various contexts.

(4) Future research endeavors should aim to involve a larger number of participants to obtain more comprehensive data. This increased sample size will facilitate the exploration of diverse perspectives, leading to the discovery of more nuanced and reliable insights. Additionally, a larger participant pool enhances the reliability of generalizations made based on the research findings.

By addressing these suggestions in future research, a more robust understanding of the potential benefits and applicability of GFCA can be achieved, offering valuable insights for educational practitioners and researchers alike.

References

- Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. Virginia: International Society for Technology in Education
- Bergmann, J., Overmyer, J., & Willie, B. (2012). The flipped class: Myths versus reality. *The Daily Riff*. Retrieved from <http://www.thedailyriff.com/articles/the-flipped-classconversation-689.php>.
- Brown, H. D. (2012). *Teaching by Principles: An Interactive Approach to Language Pedagogy*. New-York: Longman.
- Burke, B. (2014). *Gamify: How Gamification Motivates People to Do Extraordinary Things*. Brookline, MA: Bibliomotion Incorporated.
- Cooke, S., & Tohei, A. (2015). The effects of flipped classrooms on English composition writing in an EFL environment. *International Journal of Computer-Assisted Language Learning and Teaching (IJCALLT)*, 5(4), 37-51. <https://doi.org/10.4018/IJCALLT.2015100103>
- Danowska-Florczyk, E., & Mostowski, P. (2012). Gamification as a new direction in teaching Polish as a foreign language. paper presented at International Conference "ICT for Language Learning" 5th edition. Retrieved November, 10, 2018 from https://conference.pixelonline.net/conferences/ICT4L2012/common/download/Paper_pdf/272-IBT55-FP-Florczyk-ICT2012.pdf
- Dornyei, Z. (2003). *Attitudes, orientations, and motivations in language learning: Advances in Theory, Research, and Applications* University of Nottingham. <https://doi.org/10.1111/1467-9922.53222>
- Howard-Jones, P. A., & Demetriou, S. (2009). Uncertainty and engagement with learning. games. *Instructional Science*, 37, 519-536. <https://doi.org/10.1007/s11251-008-9073-6>

- Kapp, K. M. (2012). *The gamification of learning and instruction: Case-based methods and strategies for training and education*. New York, NY: Pfeiffer. <https://doi.org/10.1145/2207270.2211316>
- Kelle, U. (2006). Combining qualitative and quantitative methods in research practice: Purposes and advantages. *Qualitative Research in Psychology*, 3(4), 293-311.
- Malone, T. W. (1981). *Intrinsically motivating instruction (Malone)*, in *Learning Theories*. https://doi.org/10.1207/s15516709cog0504_2
- Markee, N. (1992). The diffusion of innovation in language teaching. *Annual review of applied linguistics*, 13, 229-243. <https://doi.org/10.1017/S0267190500002488>
- McNamara, K. (1994). Ethical issues in informed consent with substance abusers. *Journal of Consulting and Clinical Psychology*, 67(2), 186-193. <https://doi.org/10.1037/0022-006X.67.2.186>
- Ministry of Information, Communication Technology of Thailand. (2013). *The Minister of ICT gave an address entitled "The policy of SMART Thailand"*. Retrieved June 29, 2017, From <http://www.mdes.go.th/view/10/All%20News/News%20and%20Events/1>
- Prensky, M. (2001). *"Digital Natives, Digital Immigrants Part 1"*, *On the Horizon*, 9(5), pp.1-6. <https://doi.org/10.1108/10748120110424816>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Thousand Oaks, Calif: Sage Publications.
- Punthumasen, P. (2007). *International program for teacher education: an approach to tackling problems of English education in Thailand*. Retrieved May 30, 2016, from <http://www.worldedreform.com/pub/paperie13dec07.pdf>
- Reinders, H., & Wattana, S. (2014). Can I say something? The effects of digital game play on willingness to communicate. *Language Learning & Technology*, 18(2), 101-123. Retrieved from <http://lt.msu.edu/issues/june2014/reinderswattana.pdf>
- Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge: Cambridge University Press.
- Shatz, I. (2015). Using Gamification and Gaming in Order to Promote Risk Taking in the Language Learning Process. *The 13th Annual MEITAL National Conference*, (January), 227-232.
- Stanley, G. (2014). Using the IWB to Support Gamification to Enhance Writing Fluency in the Secondary Language Classroom. In E. C. Schmid & S. Whyte (Eds.), *Teaching Languages with Technology: Communicative Approaches to Interactive Whiteboard Use* (pp. 152-186). London: Bloomsbury Publishing.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).