The Effects of Role-Playing Gamification on Business Vocabulary Learning and Motivation: A Study of CEFR-based Language Learning Mobile Application for Thai Undergraduate Students

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ABSTRACT

Role playing games and gamification contribute to enhanced vocabulary learning and increased learner motivation. Little research, however, examines these impacts of role-playing gamification amongst EFL learners practicing business English skills outside of class time. This study aims to investigate the effects of role-playing gamification on business vocabulary learning and motivation through a CEFR-based language learning application. The research participants were 21 Thai undergraduate students who autonomously played language learning games in the mobile application outside of class time for a duration of 4 weeks. Pre-post vocabulary test and intrinsic motivation inventory (IMI) questionnaire were used as main research instruments. Through quantitative data analysis, the
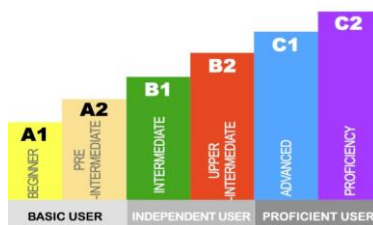
paired t-test results showed significant improvement in participants' business vocabulary performance. Nonetheless, descriptive statistical analysis of questionnaire data showed moderate levels of motivation in all sub-scales (M<4). The results of this study suggest beneficial roles of role-playing gamification in out-of-class language learning. Implications on mobile application game design and motivation for language learning are also discussed.

Keywords: role-playing gamification, business vocabulary learning, motivation, CEFR, language learning mobile application

Introduction

English language proficiency is significant for Thailand's competitiveness in the global market. To develop Thai students' English language proficiency, educational institutions at all levels, including higher education, have a crucial role in preparing students to be well-equipped with skills necessary for their future careers. While English is a subject offered to university students, the usual number of classes and lecture hours offered to students at university may be insufficient for students' language practice and the level of exposure needed to acquire a foreign language such as English. According to Thailand's National Education Plan 2017-2036, Thai university graduates are expected to graduate with English skills equivalent to the B2 level of CEFR (Common European Framework of Reference for Languages) or the upper-intermediate level (Office of the Education Council, 2017) (See Figure 1 for CEFR levels). This expectation is, however, far from reality when most Thais' English language proficiency remains at the A2 CEFR level or basic users, despite the fact that English has been taught in formal education from kindergarten to university (Teng & Sinwongsuwat, 2015). While the traditional classroom approach of grammar translation and rote memorization could be contributing factors to limited language development (Darasawang, 2007), out-of-class language learning or 'any kind of learning that takes place outside the classroom and involves self-instruction, naturalistic learning or self-directed naturalistic learning' is also crucial for language learners in becoming more autonomous of their own learning (Benson, 2001).

Figure 1

Common European Framework of Reference for Languages or CEFR levels

Literature suggests that English language learners learn English outside class based on their interests, one of which is digital games (Gee & Hayes, 2012). Out-of-class digital gaming is found to have positive impacts on language development, particularly in terms of vocabulary learning (Sundqvist, 2019). Although it might be argued that digital games are likely to attract mostly gamers, research also reports non-gamers' enhanced confidence and gains in vocabulary, listening, and oral fluency as a result of digital gaming (Li et al., 2022). Gamified environments can increase English language learners' motivation (Hanus & Fox, 2015) as well as reduce their fear of failing in language learning (Lee & Hammer, 2011). When available in digital platforms which can be accessed anywhere and anytime, digital games or gamification can provide learners with more opportunities to practice English outside class. As stated in the United Nations' sustainable development goals (SDGs), digital technology can contribute to ensuring 'inclusive and equitable quality education' and promoting 'lifelong learning opportunities for all' (SDG 4).

Although gamified educational applications, such as Duolingo, are already readily available for English language learners, topics of learning are more related to daily usage (Shortt et al., 2023), rather than work-related topics. Due to this contextual market gap, a Thailand-based software application developer company, in collaboration with the Language Institute Thammasat University, developed a gamified educational mobile application called '*Mangomon*' as an innovative platform for out-of-class English language learning specifically targeting 'English for work' skills based on the CEFR framework (Figure 2). The platform employs Role Playing Game or RPG mechanics such as the use of avatars, quests, and points (Crocco, 2016) in engaging learners while practicing English for Work skills[1]. These

motivational affordances in role playing gamification can be considered beneficial for out-of-class English language learning.

Figure 2

Mangomon's role-playing gamification

Despite various aspects of CEFR-based English Proficiency integrated in *Mangomon* game design, this study primarily focuses on English business vocabulary due to the initial stage of the educational application's development. The game content during this stage emphasizes English vocabulary in work-based contexts aiming to resolve issues of EFL learners' vocabulary learning such as word meanings, pronunciation, and the appropriate use of words in contexts (Afzal, 2019) as well as to use role-playing gamification to motivate EFL learners (especially undergraduate students) to learn and practice words necessary for their future workplace. Based on this notion, our study aims to answer the following research questions:

RQ1: What are the effects of *Mangomon*'s role-playing gamification on Thai undergraduate students' business vocabulary knowledge?

RQ 2: What are the effects of *Mangomon*'s role-playing gamification on Thai undergraduate students' motivation levels to learn English outside class through the *Mangomon* platform?

In answering the research questions, a quasi-experimental study was conducted amongst 21 business undergraduate students in a Thai public

university using a pre-post vocabulary test and Ryan and Deci's (2000) Intrinsic Motivation Inventory (IMI) questionnaire to investigate the effects of *Mangomon*'s role-playing gamification on students' vocabulary learning and motivation levels. The results of this study can inform how the role-playing gamification platform employed in this study helps improve Thai undergraduate students' business English vocabulary knowledge necessary for their future workplace as well as acts as a complementary tool for English language practice in the context of Thai higher education. The implications of study can provide future directions on developing English language education platforms in the Thai and related emerging markets to align with SDGs in quality education and lifelong learning.

Literature Review

Role-Playing Gamification in *Mangomon*

Gamification is often thought to share the same definition as game-based learning in English language teaching and learning (Nilubol & Sitthitikul, 2023). However, whereas game-based learning is the use of games to enhance the learning process (Isaacs, 2015), gamification is 'the use of design elements characteristic for games (rather than play or playfulness) in non-game contexts' (Deterding et al., 2011, p 13). While games refer to 'a system in which players engage in an abstract challenge, defined by rules, interactivity, and feedback, that results in a quantifiable outcome often eliciting an emotional reaction' (Kapp, 2012, p. 7), gamification is 'using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems' (Kapp, 2012, p.10).
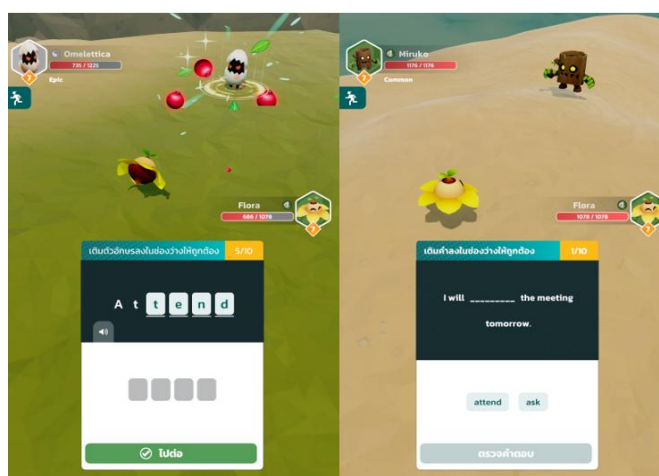
In Kapp's (2012) gamification framework for education, game-based mechanics refer to a group of tactics including the use of badges, points, leaderboards, progress bars, goals or challenges, a storyline, or immediate feedback, whereas aesthetics involves the well-designed experience essential for learners to accept gamification. In addition, gamification incorporates game thinking or 'thinking about an everyday experience like jogging or running and converting it into an activity that has elements of competition, cooperation, exploration, and storytelling' (Kapp, 2012, p. 11).

In this research context, gamification refers to the use of game-based mechanics, aesthetics, and game thinking within the context of '*Mangomon*' application. Since role-playing games or RPG mechanics are used in *Mangomon*, the term 'role-playing gamification' is employed in this study. RPG design for gamification in education includes the use of characters or avatars,

experience points to track learning progress, participate in collaborative 'party' or 'guild' activities and complete quests, as well as develop characters by earning experience points after each session of play providing incentive to keep playing (Crocco, 2016). These mechanics are designed to keep users engaged and motivated while simultaneously learning the English language necessary for a future career. Moreover, the design of *Mangomon* focuses on the aesthetics of avatars (e.g., monster buddy), appealing scenes and digital environments which encourage English language learners to log in frequently and compete in a gamified environment (Figure 3).

Figure 3

Mangomon's aesthetics design

Due to the benefits of promoting learning, motivation, and engagement, gamification has been applied in various settings. In traditional language classrooms, for instance, gamified activities can facilitate language skill development including listening, speaking, reading, writing, vocabulary, and grammar skills (Nilubol & Sitthitikul, 2023). On the other hand, the integration of gamification in mobile-assisted language learning (or MALL) is also evident (Dehganzadeh & Dehganzadeh, 2020), with Duolingo being one of the most widely-used mobile language learning applications due to its gamification features (Shortt et al., 2023). *Mangomon*, similarly, is designed as an English language learning mobile application; however, it includes RPG mechanics making it different from Duolingo in terms of its 'role-playing' gamification features.

Role-Playing Gamification, Vocabulary Learning, and Motivation

Role-play games or RPG is often linked to the concept of digital game-based learning (DGBL) in the context of educational technology and has a vivid role in promoting vocabulary learning amongst EFL learners (Zou et al., 2019). Research shows that vocabulary learning can be a demanding task for EFL learners due to the amount of time and effort to memorize words and retain word memory (Waluyo & Bucol, 2021). Due to the motivational affordances of digital games, numerous studies concerning digital game-based for vocabulary learning (DGBVL) (Zou et al., 2019) and mobile-assisted gamification for vocabulary Learning (e.g., Fithriani, 2021) have been conducted. Fithriani (2021), for instance, investigated the effectiveness of mobile-assisted gamification on Quizlet on Indonesian undergraduate students' vocabulary learning and perceived benefits. Through a quasi-experimental design adopting the pre-post vocabulary test and perception questionnaire, the study shows enhanced enjoyment and motivation, and improved vocabulary learning outcomes amongst the EFL students (Fithriani, 2021). It should be noted, however, that the vocabulary set focused in Fithriani's (2021) study is from General English class, and could therefore influence the difficulty of words learned and tested. For business English (which is the focus of *Mangomon*), the required level of English language proficiency should be at least B1 CEFR level (Cambridge University Press & Assessment, n.d.) equivalent to a level where an independent user can communicate in English at an intermediate level (Council of Europe, 2020). This requirement reflects the complexity of business vocabulary and its potential impact on EFL learners' vocabulary acquisition.

Kohnke et al. (2019) conducted research on the utilization of mobile games in aiding business English vocabulary retention amongst Chinese-speaking undergraduate students in Hong Kong. In the study, a mobile application with some gamification features such as level challenges completion was employed to facilitate students' learning of business words across various difficulty levels. It was found from the pre-post vocabulary test scores that the mobile application with gamification features in the study can enhance students' business vocabulary knowledge and retention. Although students scored higher for more basic words, the results also showed improved scores for some difficult words, reflecting the ability of mobile

games to assist EFL learners in acquiring more difficult words in the discourse of business English.

Vocabulary learning through mobile-assisted gamification is closely associated with enjoyment and motivation (Fithriani, 2021). Literature has shown that gamification can be used as a strategy to increase motivation and engagement which can consequently impact the learning outcomes (Chans & Portuguez Castro, 2021). Motivation has long been regarded as an important construct in understanding language learning with widely adopted theories such as L2 Motivational Self System (Dörnyei & Ryan, 2015) and Self Determination Theory (or SDT) (Ryan & Deci, 2000, 2020). Unlike Dörnyei and Ryan's (2015) L2 Motivational Self System framework, which emphasizes the future self of language learners, Self Determination Theory is process-oriented focusing on the quality of motivation to explain why learners become engaged in a language activity (Ryan & Deci, 2020). In gamification, motivation is commonly explored through the lens of SDT using intrinsic motivation inventory (IMI) questionnaire (Luo, 2024). According to Ryan and Deci (2000), human motivation is derived from innate psychological needs for autonomy, competence, and relatedness. Autonomy is concerned with 'a sense of initiative and ownership in one's actions' while competence involves 'the feeling of mastery, a sense that one can succeed and grow' and relatedness is 'a sense of belonging and connection…facilitated by conveyance of respect and caring' (Ryan & Deci, 2020, p. 1). Table 1 demonstrates how autonomy, competence and relatedness can be related to Mangomon's role-playing gamification.

Table 1

Autonomy, Competence, and Relatedness in Mangomon's Role-playing Gamification

Innate Physchological Needs	Mangomon's Role-playing Gamification
Autonomy	Learners' choice and control over a large variety of achievements and rewards
Competence	Vocabulary acquisition and mastery through the repeated answering of language questions
Relatedness	Collaboration and competition options

To understand how one's motivation may be derived, IMI with various sub-scales has been developed. The most current version of IMI contains seven sub-scales of interest/enjoyment, perceived competence,

effort/importance, pressure/tension, perceived choice, value/usefulness, and relatedness (Self-Determination Theory, n.d.). Based on this version of IMI, the interest/enjoyment subscale is regarded as the only one sub-scale which directly assesses intrinsic motivation, whereas perceived choice and perceived competence concepts are considered positive predictors of intrinsic motivation. Pressure/tension, on the other hand, is a negative predictor of intrinsic motivation in the IMI framework. Other sub-scales such as effort and relatedness, although not directly concerned with intrinsic motivation, are included to provide a clearer understanding of motivation. Value/usefulness, in particular, relates to individuals becoming self-regulating with tasks or activities deemed as useful or valuable to them. By employing Ryan and Deci's (2000) Intrinsic Motivation Inventory, this study can examine the effects of role-playing gamification on intrinsic motivation which can enable individuals to become autonomous lifelong learners.

Methodology

Research Context

Mangomon combines the collection and battle mechanics of Pokémon with the language practice features of Duolingo. This hybrid design leverages the motivational affordances of RPG gameplay while grounding progression firmly in repeated vocabulary and grammar practice, particularly appealing to younger learners and young adults who are already accustomed to these cultural and digital references. The principles of game design are grounded in Crocco's (2016) RPG elements of mechanics, aesthetics and game thinking.

In terms of RPG mechanics, players assume the role of their own *Mangomon* character and engage in battles by answering language learning questions in the form of cards that test vocabulary and grammar knowledge. Correct answers allow the character to "fire power" at the opponent monster, with the damage level varying by the strength of the monster. Victories provide an opportunity to collect a reward in the form of mangoes, which function as capture tools. Three types of mangoes—normal, silver, and gold—offer different probabilities of successfully catching a *Mangomon*, with the gold mango providing the highest capture chance (>50%). In addition, players accumulate coins throughout gameplay. These coins can be used to upgrade levels or purchase higher-quality mangoes, thereby increasing the chances of monster collection. Progression through the game follows a linear sequence of stages. Players must complete each stage in order and eventually confront "boss monsters" that require cumulative knowledge from previous lessons. The overall hook of the game lies in the collection mechanic: players

are motivated to collect increasingly rare *Mangomon* by successfully mastering vocabulary and grammar at each stage.

Apart from the RPG mechanics, *Mangomon* also integrates language learning through card mechanics. The card mechanics function as the learning engine of the game. Similar to Duolingo, cards present tasks such as gap-filling, spelling, and contextual vocabulary usage. Correct responses enable combat actions, while incorrect answers limit player success in battles. This direct connection between language performance and in-game progress integrates learning with play, ensuring that improvement in vocabulary directly translates to advancement in the game.

With regard to aesthetics, the game employs a 3D, Pokémon-style visual aesthetic with an overarching theme of island travel. The environment includes varied landscapes, colorful characters, and animated monsters, creating an immersive and visually appealing learning atmosphere. This design was purposefully aligned with the interests of the target user group, aged approximately 15 to 30, who are generally familiar with both Pokémon and Duolingo. The playful yet structured design balances familiarity with novelty, encouraging learners to engage consistently with the application (Kapp, 2012).

For game thinking in *Mangomon*, the player experience is built around motivation through collection, repetition, and mastery. Students are encouraged to explore new monsters, while the repeated answering of language questions reinforces vocabulary acquisition. The game design ensures that learning is embedded in the combat and collection process, so progress requires mastery rather than passive participation. The overall experience is similar to Duolingo in terms of repeated language exercises, but with the added motivational layer of RPG battle and collection mechanics (Shortt et al., 2023).

Research Participants

This quasi-experimental study was conducted in the context of Thai undergraduate students studying various business subjects in a public university in Thailand. Twenty-one research participants voluntarily participated in the study and gave their consent prior to data collection. All participants had completed the university's English foundation course which required a pass grade equivalent to the B1 CEFR level. None of them had tried or downloaded the *Mangomon* application before they participated in the study.

Research Instruments

This study employed two main research instruments: pre-post vocabulary test and intrinsic motivation questionnaire. The vocabulary test was used to investigate vocabulary learning outcomes. Thirty gap-filling test items were developed based on business words research participants had learned in the *Mangomon* application (Table 2). 30 target words ranging from B1-C1 CEFR levels were selected for 30 test items. The distribution of business vocabulary test items was heavily weighted toward B2-level items, reflecting the research participants' target English language proficiency (Table 3). Test scores were mapped with the CEFR level to identify students business vocabulary knowledge (Table 4). Prior to administering the test, all test items were piloted and validated by three experts in the field of English language education. In terms of questionnaire, 22 questionnaire items adapted from Intrinsic Motivation Inventory (IMI) with seven-subscales (Self-Determination Theory, n.d.) were applied in the context of *Mangomon*'s role-playing gamification. 1–5-point Likert scale was used for ranking each questionnaire item.

Table 2

Examples of Gap-filling Test Items

CEFR Level of Target Words	Gap-filling Test Items
B1	Our customer service team is always ready to *a*_____ clients by providing support and guidance with any inquiries they may have. *(help or support someone)*
B2	The company is ready to *i*_____ the new software system to improve efficiency. *(put a plan or system into action)*
C1	The company offers an *e*_____ membership program that gives VIP clients early access to new products and special discounts. *(only available to a specific group of people)*

Table 3

Distribution of Business Vocabulary Test Items

CEFR Level	Number of Items	Examples of Target Words
B1	10	assist, ignore, resource
B2	16	approve, expense, implement
C1	4	chaos, exclusive, nominate

Table 4

CEFR-based Vocabulary Test Scores

Raw score (0–30)	CEFR level
0–5	A2 or below
6–13	B1
14–25	B2
26–30	C1

Data Collection

After having given consent, the research participants took part in a 30-minute workshop where the researchers introduced role-playing gamification and provided instructions on how to play the *MangoMon* game in the study. After the workshop, student participants took the 20-minute pre-test to test their business vocabulary knowledge and were given 4 weeks to complete 45 lessons in the *Mangomon* game to accommodate varying learning paces. The completion of lessons could be anytime and anywhere outside class time. After the end of each week, the participants reported the progress of lesson completion (Table 5). At the end of week 4, the post-test was administered and the scores were used in comparison with the pre-test to identify the effects of *Mangomon*'s role-playing gamification on students' business vocabulary learning. After the test, the participants completed the intrinsic motivation questionnaire in Google Form.

Table 5

Weekly Progress on Lesson Completion

Lesson Sets Completed	Week 1	Week 2	Week 3	Week 4
Average	16.48	27.81	35.85	45
Lowest	2	8	12	45
Highest	45	45	45	45

Data Analysis

Data analysis in this study involved quantitative data analysis of the pre-post test scores and questionnaire data. Descriptive statistical analysis was conducted to summarize the pre- and post-test scores, including frequencies, minimum and maximum scores, percentages, and means. In addition,

inferential statistics were used to examine whether the differences between pre- and post-test scores were statistically significant. Shapiro-Wilk Test was applied due to the small sample size (N<50) (Mishra et al., 2019). Afterwards, paired t-test was conducted to determine if there was a significant difference between the pre-test and post-test scores. In terms of questionnaire data, descriptive statistics (frequency, means, and standard deviation) were used.

Results and Discussion

Effects on Business Vocabulary Performance

The results from the pre-test scores showed that participants' business vocabulary knowledge ranged between B1 and B2 CEFR levels (Table 6) when compared with the post-test scores' range between B2 and C1 CEFR levels (Table 7). A comparison of pre-test and post-test score distribution illustrated in Figure 4 shows a shift in test scores to higher CEFR levels. Results of the Shapiro–Wilk test indicated that the data were likely drawn from a normal distribution ($p > 0.05$) (Table 8). For pre-test, scores ranged from 7 to 21 (out of the full score of 30 points or 30 items), whereas post-test scores were reported between 21 and 30. From these results, it could be seen that the minimum test scores improved significantly (pre-test = 7, pos-test = 21) and so were the maximum test scores (pre-test = 21, post-test = 30). The pre-test mean score (M = 17.14, SD = 7.17) was lower than the post-test mean score (M = 26.18, SD = 2.50), and this difference was statistically significant, $t(20) = 6.99$, $p < .0001$ (Table 9).

Table 6
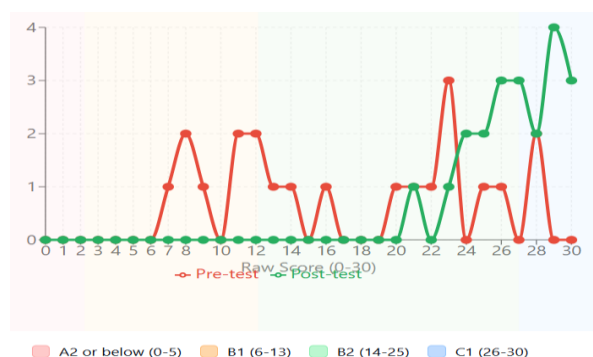
Pre-test Vocabulary Scores Mapped with CEFR Levels (n = 21)

Score Range	CEFR level	Minimum Score	Maximum Score	Frequency (n)	Percentage
6-13	B1	7	12	9	42.85714
14–25	B2	14	25	9	42.85714
26–30	C1	26	28	3	14.28571

Table 7

Post-test Vocabulary Scores Mapped with CEFR Levels (n = 21)

Score Range	CEFR level	Minimum Score	Maximum Score	Frequency (n)	Percentage
14–25	B2	21	25	6	28.57143
26–30	C1	26	30	15	71.42857

Figure 4

Pre-test and Post-test Score Distribution

Table 8

Shapiro-Wilk Test for Mean Scores

Scores	N	Mean	Shapiro-Wilk W	p-value	Normality Conclusion
Pre-test	21	17.1429	0.9133	0.0638	Normally distributed (p > 0.05)
Post-test	21	26.8095	0.9422	0.2411	Normally distributed (p > 0.05)

Table 9

Pre-test and Post-test Scores of Vocabulary test

Score	N	Min	Max	Mean	S.D.	t	df	P
Pre-test	21	7	28	17.14	7.17	6.99	20	<0.0001
Post-test	21	21	30	26.81	2.50			

Based on the pre-test and post-test scores, it may be concluded that *Mangomon*'s role-playing gamification could improve the undergraduate students' business vocabulary performance within a four-week period when *Mangomon* mobile application was used outside of class time at students' own leisure. The study results were in conjunction with previous studies

confirming positive impacts of mobile-assisted gamification on EFL learners' English vocabulary learning (Fithriani, 2021, Zou et al., 2019. The shift in the average CEFR band score from B1-B2 in the pre-test to B2-C1 in the post-test also indicates the effects of *Mangomon*'s role-playing gamification on business English vocabulary learning and word retention, implying potential positive impacts of mobile digital games on learning more advanced business vocabulary (Kohnke et al., 2019). However, without a control group, it is possible that students' improved scores might result from vocabulary learning outside of Mangomon rather than the intervention itself.
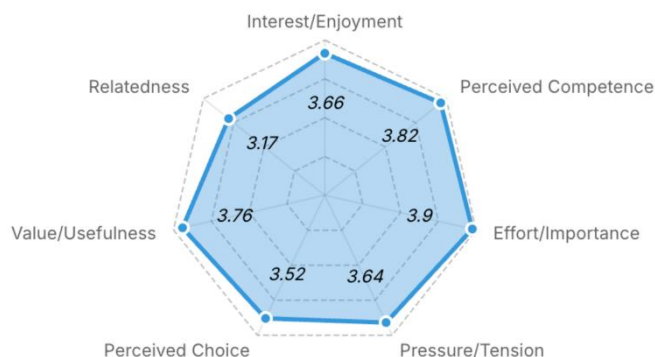
Table 10

Effect size of the mean scores

Scores	N	Mean	SD	Cohen's d
Pre-test	21	17.1429	7.17	1.800344
Post-test	21	26.8095	2.5	

In this study, the effect size was also calculated and was considered large (Cohen's d = 1.80), meaning that the magnitude or strength of the findings shows that the intervention worked effectively and the relationship between variables is strong. This result has revealed the practical importance of the results, indicating that the difference between the pre-test and post-test scores is meaningful.

Effects on Motivation Levels

Questionnaire results based on Intrinsic Motivation Inventory (IMI)'s seven sub-scales demonstrated a moderate level of mean scores in all subscales (M < 4.00). Effort/important was ranked the highest (M = 3.90), followed by perceived competence (M = 3.82), value/ usefulness (M = 3.76), relatedness (M = 3.67), interest/ enjoyment (M = 3.66), pressure/ tension (M = 3.64), perceived choice (M = 3.52), respectively (Figure 5). All questionnaire items' mean scores were also below 4.00, confirming moderate levels of participants' motivation (Table 10). Nonetheless, it should be noted that SD values of all questionnaire items are above 1.00, indicating dispersion in the data set and various views of participants in terms of their perceived motivation on using *Mangomon*'s role playing gamification to practice their business English vocabulary while enjoying mobile gamification with RPG features.

Figure 5

Students' Perceived Motivation Radar Chart

Participants' responses on effort/ importance (M = 3.90) and perceived competence (M = 3.82) correspond with their increased vocabulary performance in post-test scores. The highest ranked questionnaire item 'I put a lot of effort into answering questions to defeat Mangomon.' (no. 13) in the sub-scale of effort/importance (M = 3.95) demonstrates participants' effort to defeat Mangomon in the mobile game. The drive to win the game is accompanied by the second-highest ranked items within the sub-scales of perceived competence and usefulness. For perceived competence, the questionnaire items were no. 6 'I think I am pretty good at playing Mangomon.' (M = 3.90) and no. 7 'After playing Mangomon for a while, I felt pretty competent in answering questions to defeat Mangomon.' (M = 3.90). With regard to value/ usefulness, the items include no. 20 'I think playing Mangomon could help me to practise my English.' (M = 3.90) and no. 21 'I think repetitive vocabulary in the questions could help me improve my English.' (M = 3.90). On the other hand, the lowest-ranked items were within the subscales of interest/ enjoyment, i.e. 'I enjoyed catching Mangomon.' (no. 3) (M = 3.52) and perceived choice, i.e. 'I played Mangomon because I wanted to.' (no. 17) (M = 3.52).

Table 11

Questionnaire Results Based on Intrinsic Motivation Inventory (IMI)

No.	Categories	Frequency					Mean	SD
		1	2	3	4	5		
A. Interest/enjoyment							**3.66**	
1.	I enjoyed playing Mangomon.	3	1	6	2	9	3.62	1.47
2.	I enjoyed answering questions to defeat Mangomon.	2	3	3	3	10	3.76	1.45
3.	I enjoyed catching Mangomon.	4	0	6	3	8	3.52	1.50
4.	I would describe catching Mangomon as very interesting.	2	3	5	2	9	3.62	1.43
5.	I would describe answering questions to defeat Mangomon as very interesting.	1	1	8	3	8	3.76	1.18
B. Perceived Competence							**3.82**	
6.	I think I am pretty good at playing Mangomon.	4	0	2	3	12	3.90	1.58
7.	After playing Mangomon for a while, I felt pretty competent in answering questions to defeat Mangomon.	3	2	1	3	12	3.90	1.55
8.	After playing Mangomon for a while, I felt pretty competent in catching Mangomon.	3	2	2	3	11	3.81	1.54
9.	I am satisfied with my performance at answering questions to defeat Mangomon.	3	2	1	4	11	3.86	1.53
10.	I am satisfied with my performance at catching Mangomon.	3	1	3	4	10	3.81	1.47
11.	I was pretty skilled at answering questions to defeat Mangomon.	3	2	1	6	9	3.76	1.48
12.	I was pretty skilled at catching Mangomon.	3	2	3	4	9	3.67	1.49
C. Effort/Importance							**3.90**	
13.	I put a lot of effort into answering questions to defeat Mangomon.	1	3	3	3	11	3.95	1.32
14.	I put a lot of effort into catching Mangomon.	2	2	2	6	9	3.86	1.35
D. Pressure Tension							**3.64**	
15.	I was very relaxed in answering questions to defeat Mangomon.	4	1	2	5	9	3.67	1.56
16.	I was very relaxed in catching Mangomon.	4	1	3	4	9	3.62	1.56
E. Perceived choice							**3.52**	
17.	I played Mangomon because I wanted to.	1	5	4	4	7	3.52	1.33
F. Value / Usefulness							**3.76**	
18.	I think that playing Mangomon is useful for my future career.	2	3	2	7	7	3.67	1.35
19.	I would be willing to play Mangomon again because it has some value to me.	1	5	3	5	7	3.57	1.33
20.	I think playing Mangomon could help me to practice my English.	4	1	0	4	12	3.90	1.61
21.	I think repetitive vocabulary in the questions could help me improve my English.	3	3	0	2	13	3.90	1.61
G. Relatedness							**3.67**	
22.	I would like a chance to interact with Mangomon more often.	1	3	5	5	7	3.67	1.24

From the questionnaire results, it could be seen that participants perceived *Mangomon* as a useful game in helping them to practice their English. Moreover, the game mechanism which asks them to repeat certain tasks or certain business vocabulary items could lead to improved English language

proficiency. Participants 'put a lot of effort into answering questions to defeat Mangomon' (M = 3.95) and 'felt pretty competent in answering questions to defeat Mangomon' (M = 3.90). These factors related to 'competence' in Ryan and Deci's (2000, 2020) SDT could refer to participant's feeling of their own ability to complete the tasks in the game which could be linked with their motivation to play the game. Despite these positive aspects of effort and competence, issues related to interest/enjoyment and perceived choice are evident. Although participants voluntarily participated in this research project, it seems that they would not choose to play *Mangomon* if offered outside the project. More importantly, the lowest mean score related to enjoyment in 'catching Mangomon' (no. 13, M = 3.52) provides significant implications in terms of choice and interest/ enjoyment. Interest/ enjoyment, in particular, has a direct link with intrinsic motivation and 'autonomy' of learner needs (Ryan & Deci, 2000, 2020). Although participants perceived *Mangomon* as a useful tool to practice their English and English vocabulary, the design of RPG mechanics or role-playing gamification might not 'yet' fully serve the needs of 'autonomy'.

Business Vocabulary Learning and Motivation in Role-Playing Gamification

While the pre-test and post-test results in this study showed significant improvement in students' business vocabulary performance, the questionnaire data displayed moderate levels of motivation amongst the Thai undergraduate students. Especially, in terms of perceived choice and interest/ enjoyment which are directly related to intrinsic motivation and learner 'autonomy' (Ryan & Deci, 2000, 2020), the sense of 'autonomous' learners was not as prevalent as 'competent' learners who viewed games as a tool to achieve their language learning goals. It is possible that choices in game paths and achievements in Mangomon's RPG mechanics are not sufficiently enjoyable for the students. Although repetitive tasks could enforce vocabulary acquisition and sense of mastery or competence, these tasks could also reduce motivation if the task design cannot enforce continued enjoyment. In this sense, out-of-class digital games may have positive effects on vocabulary learning (Sundqvist, 2019), but it may raise questions regarding continued engagement and motivation to participate in gamified environments. Although *Mangomon* is designed as a language learning mobile application, the intention is to engage language learners through RPG mechanics or role-playing gamification. Without enjoyment, players may become less interested in the game and thus discontinue their participation and engagement.

As a pilot study, this study employed a rather small number of sampling size (n = 21) and was conducted in a limited time frame. However, the study provided results which could help us to understand the effects of role-playing gamification on business vocabulary learning and motivation levels amongst Thai undergraduate students. Based on these findings, future research can investigate in detail the mechanics, aesthetics, and game playing (Kapp, 2012) which can enhance enjoyment and subsequently intrinsic motivation. It seems that language learning goals may not be sufficient to motivate learners to actively use mobile language learning applications. Incorporating game elements that promote interest and enjoyment, or intrinsic motivation, is crucial for supporting autonomous learners in their sustainable lifelong language learning.

Conclusion

This quasi-experimental study is a pilot study investigating the effects of role-playing gamification on business vocabulary learning and motivation through Mangomon, a CEFR-based language learning application developed by a software company based in Thailand. Targeting English skills for work, the application was designed with the objective of developing English language proficiency for Thai learners and related emerging markets. In this study, only business vocabulary was examined due to the application's initial stage of research and development. Based on the pre-post test scores and motivation survey results, it can be concluded that the undergraduate students in the study improved their business vocabulary significantly when playing Mangomon outside class at their leisure. However, the survey results demonstrated motivation at moderate levels, signifying gaps for improvement in terms of RPG mechanics design. While students wanted to put effort into language learning through the business vocabulary card mechanics, their interest and enjoyment could not yet be fully enhanced by RPG.

The results provide implications for further investigation regarding the effects of role-playing gamification on motivation to learn language. While it is evident that role-playing gamification can facilitate language learning, more research is needed into the relationship between role-playing gamification and motivation in learning a language. Especially for English for Specific Purposes (ESP), such as business English, if learners have a specific aim to develop their business English skills, it is questionable how RPG game design can complement this learning goal or whether it is at all necessary. Future studies can further explore the roles of role-playing gamification and motivation in learning ESP and English for work, which are crucial for developing a workforce equipped with English language skills for the increasingly global workplace.

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Endnotes

[1] In *Mangomon*, players assume the roles of characters in a fictional setting and use their monster buddy to fight with the opponent monsters. The buddy fights by using 'English for work' skills depending on game levels

and progress to the next level when they win. The English language content used in battles is all related to English for work (e.g., business meetings, job applications, business travels, and working together) and levelled based on the CEFR framework.

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