

Effects of Gamification on Chinese EFL College Students' Writing Error Awareness and Writing Performance

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Abstract

English writing is an important course to improve students' comprehensive use of language. However, in the current practice of English writing teaching, college students in China still have a variety of problems in writing English compositions. Therefore, how to further improve students' English writing ability has always been the focus and difficulty of English writing teaching. Although the traditional Error Analysis Theory has systematically studied the common mistakes in college English writing, students' awareness of common mistakes in English writing still needs to be further improved. The thesis attempts to explore the effectiveness of gamification learning in improving students' error awareness and writing performance, as well as students' perception of gamification methods and traditional teaching methods. The experimental results showed that: 1) Gamification learning can help improve students' awareness of common mistakes in English writing. 2) Gamification learning has obviously raised students' comprehensive writing results, of which the misformation errors have been improved most significantly, followed by the improvement of cohesion/coherence, content/organization and language. 3) Gamification has been accepted and praised by most students because the instructional content in gamification is more professional, targeted and meaningful, and game design is more interesting and challenging. This study attempts a new exploration to apply gamification into English writing teaching, and has obtained satisfactory results, which has provided not only pedagogical suggestions for English writing teaching, but also some enlightenment for the future studies of gamification in English writing teaching.

Keywords: gamification, Chinese learners, error analysis theory, awareness of common errors, college English writing

1. Introduction

In recent years, English writing has attracted a great deal of concern due to its importance in second language learning. As for learners who select English as their second language (ESL), they are generally required to master four basic skills of language learning namely, listening, speaking, reading and writing. However, it's the most challenging to improve writing competence or scores. In order to motivate and engage students to learn or master English writing skills, scholars have applied gamification into English writing. With the fast development of mobile-Assisted learning, more scholars focus on the fact that games are conducive to the enhancement of students' motivation in language learning. Therefore, some scholars attempt to combine game elements with language learning so as to improve learners' language skills such as listening, speaking, reading, writing and translating. "Gamification" was first proposed in 2002 by Nick Pelling, but it wasn't until 2010 that this concept was widely studied (Kim, 2015). In order to understand better the concept of gamification and its process of influencing learning outcomes, Landers (2014) proposed "Gamified Learning Theory" which emphasizes that students' motivation-attitudes or behaviors can moderate and mediate the gamified learning process. Kim (2015) also proposed that it is essential to combine the enhancement of motivation and learning outcomes in gamification. In particular, not only does gamification focus on the extrinsic motivation, but also gamification makes full use of intrinsic motivation. Besides, Laremenko (2017) defined intrinsic motivation as an inner desire to achieve the ultimate goals. Additionally, more and more scholars employed application of gamification into language learning. They summarized that gamification can stimulate students' motivation and engagement in language learning and put forward some gamified learning apps such as *Elevate*, *Hellotalk*, *Busuu* and so on. Several studies (Li et al., 2019; Ling et al., 2019) conducted practical experiments and investigated the effects of gamified learning apps on language learning. They found that game elements in gamification can stimulate students' extrinsic motivation and

then urge them to focus on it. And game settings such as immediate feedback, rewards, points, leaderboards, levels can enhance students' intrinsic motivation to keep learning on a gamified learning app for a long time. However, there are rarely studies on gamified learning of English writing inside China and outside China. For instance, Wiethof et al. (2020) and Tantawi et al. (2016) proposed that gamification has a positive effect on English writing skills and performance. But they have never investigated how the improvement of writing performance is influenced by gamification. From students' perspectives, Yavuz et al. (2020) found that gamification can lower students' anxiety in English writing.

So far, there is not much empirical research concerning the effectiveness of gamification on students' error awareness and writing performance based on the EA theory. Therefore, it's of vital significance to explore the effects of gamification on error awareness and verify the feasibility of gamification in college English writing teaching. There are three predominant purposes in the present study. First and foremost, the thesis attempts to explore the effects of gamification (by means of the *Elevate app*) on students' awareness of common errors in English writing based on EA theory. Besides, the effects of gamification on writing performance and skills for EFL students are expounded in this study. Additionally, the thesis illustrates students' perceptions of gamification methods and traditional teaching ways.

2. Literature Review

Based on recent studies, there is no difference between the concept of gamification and gamified learning. Deterding et al. (2011) defined gamification "as the use of game design elements in non-game contexts". In addition, in the Gamified Learning Theory, as explicated by Landers, R. N. (2014), gamification was defined as "the use of a game's attributes outside of the context of a game with the purpose of affecting learning-related behaviors or attitudes". The concepts of gamification and gamified learning are used interchangeably. Therefore, gamification and gamified learning are the identical concepts in the study. Gamification seems like an "umbrella name" of using game elements to motivate and engage learners in non-game contexts. However, gamification (or gamified learning) is different from serious games or video games (See Figure 1).

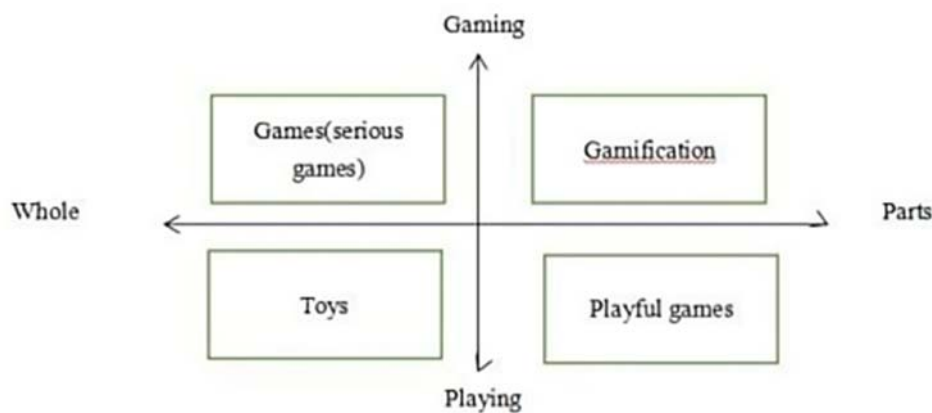


Figure 1. Gamification between gaming and playing, whole and parts (adapted from Deterding, 2011)

2.1 An introduction to The Gamified Learning Theory

In the theory of gamified learning, the most significant relationships are the influence of instructional content on learning outcomes and behaviors or attitudes (A-B and A-C). According to Landers (2014), the gamification aims to improve the instructional content rather than take its place. Learners' behaviors and learning outcomes can be changed and influenced by different disciplines. Therefore, gamification with well-design and high-quality instructional content could exert a positive influence on learning outcomes. Besides, the influence of behaviors or attitudes on learning outcomes (see C-B in Figure 2) plays an important part in the theory of gamified learning. Thus, designers of gamification should attach vital importance to learners' behaviors and attitudes. Landers (2014) points out that gamification needs to arouse learners' motivation through game rewards like notes or through meta-cognitive reminders. Only in this way could students' learning performance be improved.

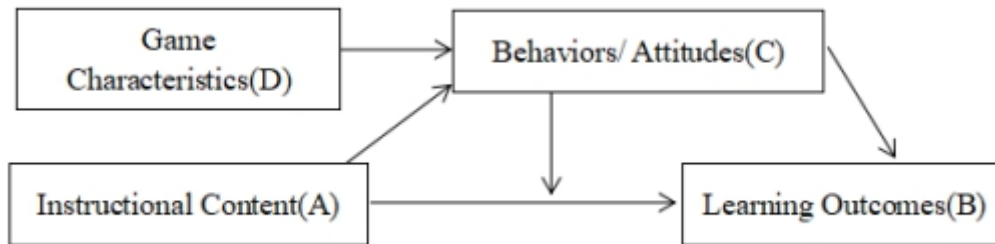


Figure 2. Theory of gamified learning (adapted from Landers, 2014)

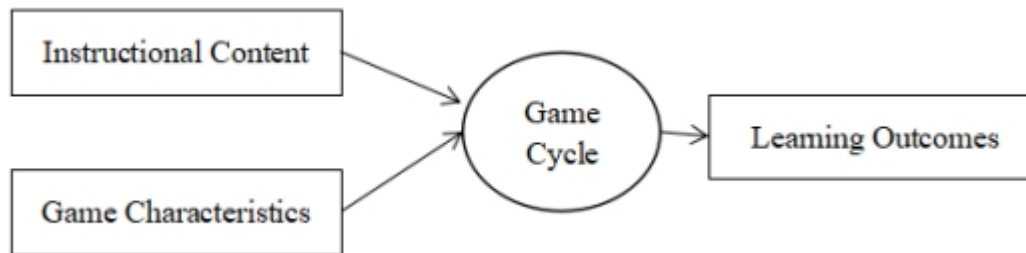


Figure 3. The model of serious games (adapted from Garris et al., 2002)

Additionally, the theory of gamified learning puts emphasis on learners' attitudes towards game characteristics (see D-C in Figure 2), which can encourage learners to produce positive and effective learning outcomes. According to Dicheva et al. (2015), game elements are divided into two sorts: gamification design principles and game mechanics. Variations in design principles correspond to different game mechanics such as *Goals, Challenges, Customization, Progress (e.g. Points, Levels), Feedback, Competition (e.g. Badges), Accrual Grading, Visible Status (e.g. Leaderboards, Avatars), Access/Unlocking Content, Freedom of Choice, Freedom of Fail, Storytelling, New Identities, Onboarding, and Time Restriction (Countdown Clock)*. The game elements can exactly motivate and engage learners to produce positive outputs. Landers et al. (2017) proposed that *Badges* and *Leaderboards* would prompt learners to play games for their competitiveness and playfulness, and such target behavior would improve learning.

Last but not least, one moderating process (see C on A-B in Figure 2) and two mediating processes (see A-C-B and D-C-B in Figure 2) are explicated as follows. Learners' behaviors or attitudes are influenced by game characteristics and then moderate the relationship between instructional content and learning outcomes. In this process, instructional content couldn't independently influence learning outcomes. Firstly, teachers or gamification designers can improve learning outcomes by improving the quality of instructional content. Secondly, learning outcomes can be improved by changing game characteristics (or game elements). Besides, there are two mediating processes. One is that motivation mediates the influence of game characteristics on learning outcomes. The other refers to the role of instructional content played in learning outcomes.

2.2 The Application of Gamification into Language Learning

On the basis of Web of Science database, Vosviewer visualization software was used to analyze recent studies on application of gamification into language learning in this section. In the study, the 249 recent studies outside China on gamification and language learning indexed from web of science during 2012 to 2022 were analyzed by using bibliometrics method (See Figure 4), whereas the 84 related studies inside China during 2012 to 2022 indexed from CNKI database were analyzed by Vosviewer (See Figure 5). The emergence of gamification carries us on into an era of interactive language learning. First of all, the effectiveness of gamification applied into language learning has been studied in recent years (Deterding, 2012; Landers, 2014; Kapp, 2012; Koutropoulos, 2020, etc.). All of them found that gamification can motivate learners to acquire new vocabulary and facilitate them to connect gamified learning context and the real world. Not only does gamification promote learners to learn vocabulary, but also encourages students to learn English idioms. Nada Gamlo (2019) examined the relationship between gamification and motivation in terms of learning English. He found that gamified learning can promote Saudi female students' motivation. At the same time, most participants learn English so as not to fail the test. Consequently, instrumental motivation plays a prominent role in Saudi female students' language learning.

2.3 Error Analysis (EA) Theory and English Writing

Corder (1967) firstly put forward the EA Theory, which took the place of contrast analysis theory. In his article entitled *The Significance of Learners' Errors*, he pointed out the center of linguistics should be varied from teaching to learning (Corder, 1967). EA is intended to find learning strategies and give teaching instructions. It also provides helpful and practical methodologies so as to see a learner's language system during acquiring a second language. According to Corder's theory of EA, five steps of EA are put forward to assist the EA, which are similar to Ellis' approaches (2009): collection, identification, classification, explanation and evaluation of errors. Compared to Corder's steps, Ellis explained and categorized more carefully (See Figure 6). Not only are grammatical errors analyzed, but also misordering, omission and misformation are involved.

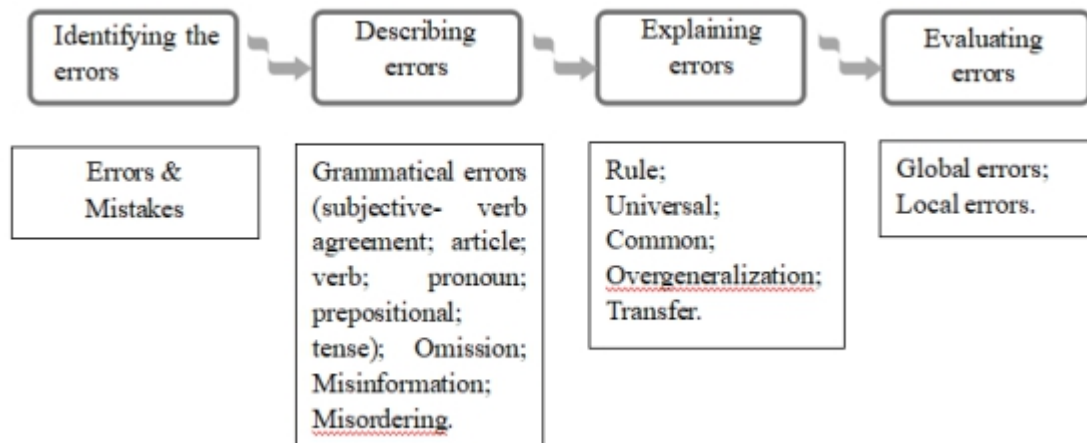


Figure 6. The Stages of Error Analysis Based on the Error Analysis Theory (Ellis, 2002)

Based on EA Theory, some scholars divided errors into social errors, register errors, referential errors and textual errors. Corder (1974) summarized two main errors—interlingual ones and intralingual ones. He proposed that these two errors are primarily caused by learners' mother tongue and target language. Based on Corder's process of EA in English writing, Ellis (2009) put forward his own error classification. He divided errors into grammatical errors, omission, misformation and misordering. Among these errors, grammatical errors are composed of subject-verb agreement error, article error, verb error, pronoun error, prepositional error and tense error. EA Theory believes that errors could not only be influenced by L1, but also target language has impacts on language acquisition (Dai & Shu, 1994; Karim et al., 2018; Brown, 1994; Al-khresheh, 2010; Corder, 1967). Therefore, error classification inside China is different from that of studies outside China. Lin et al. (2020) divided errors into errors of vocabulary, omission, repetition, misuse, misordering, misformation, structure, cohesion/coherence, expression and sentence. Based on CLEC (Chinese Learner English Corpus), Du (2001) compared common errors of middle school students with those of college students, and found that both of them lack the ability of textual organization. It is obvious that Chinese students rarely pay attention to cohesion and coherence in their English compositions, and consequently, there is no logical connection between sentences and paragraphs. Based on the previous studies, the present study divides common errors in English writing into linguistic errors, misformation, errors of cohesion and coherence, and errors of content and organization. Based on error classification, teachers could offer more detailed explanation of errors in students' writing feedback in a traditional way, but students still pay little attention to common errors that are always made in their own compositions. Meanwhile, students seldom get immediate practice after listening to lectures, so that the majority of students still make the same errors in their future compositions.

3. Methodology

3.1 Objectives of the Study

The thesis attempts to explore the effectiveness of gamification learning in improving students' error awareness and writing performance, as well as students' perception of gamification methods and traditional teaching methods. The study aims to answer 3 questions:

- 1) How does gamification exert an influence on students' awareness of common errors in English writing?

- 2) What effects does gamification bring to students' writing scores and writing performance such as misformation, language, cohesion/coherence, and content/organization?
- 3) What are students' perceptions of gamification and traditional teaching methods?

3.2 Participants

There were 55 sophomores from two classes of Beijing XXX University participating in this experiment. They are around 20 years old, with at least a 6-year English learning experience. Thirty students came from Class A majored in International Trade and another twenty-five students from Class B majored in Marketing, namely the experimental group (EG) and the control group (CG). Before the experiment, all students claimed that they had never systematically learned common errors in English writing and students in the EG had never made use of gamification, *Elevate app*, to learn English writing. Therefore, all of them were eager to participate in this experiment. Besides, all participants have passed CET-4, all of whom are preparing for TEM-4. In order to ensure that all students from the two groups are at the same level of English writing, all of them are asked to take a pretest of writing a composition before the experiment. The composition materials were adopted from TEM-4 English writing. Their scores of the two groups were analyzed by SPSS 22.0. According to the result of Independent-Samples T test, there is no significant difference between scores in the EG and the CG ($t = 0.246$, $df = 53$, $p = 0.807 > 0.05$), which means control experiment can be carried out in this study.

3.3 The Experiment

In this section, pretest, post-test, teacher intervention and reflective journals were involved in this experiment, which were briefly introduced first. Then predominant research instruments are demonstrated in detail, such as questionnaires before and after the experiment, *Elevate app*, online automatic evaluation (*iWrite*) and semi-structure interview. The experiment was carried out within 10 weeks when gamified learning and traditional English writing methods (in the form of mini-lecture videos due to COVID-19) were introduced to participants.

There are three stages in this experiment, including before experiment, during experiment and after experiment. Before the experiment, the author briefly introduced the content to the participants, and asked them about willingness to participate in this experiment in the form of a pre-questionnaire. Besides, *Elevate app* was introduced to students in the EG who needed to learn how to use it. And then a pretest was conducted, which aims to verify there is no difference between the EG and the CG. After collecting students' compositions, the author input essays into *iWrite 2.0* and asked an experienced teacher to assess the compositions as well according to the TEM-4 writing criteria. To make sure the consistency of scores of *iWrite2.0* and that of teacher feedback, Pearson Correlation in SPSS 22.0 proved that there is no significant difference ($p < 0.01$) between these two feedback ways. Then the average scores of *iWrite2.0* and teacher feedback are students' final scores.

During experiment, every two weeks is called one learning cycle (totally 4cycles). Within every two weeks, participants needed to learn some knowledge of common errors in English writing from the mini-lecture videos in the former weeks as well as writing reflective journals, and students in EG needed to play assigned 3 games in *Elevate app*; and participants were asked to write a TEM-4 composition in the latter weeks. Additionally, the composition in the ninth week was considered as the post-test. After the experiment, post-questionnaire and semi-structure were conducted in EG. In other words, students in the CG received the same instructions but they didn't complete questionnaires, attend interviews and complete tasks of the *Elevate app* (See Figure 7).

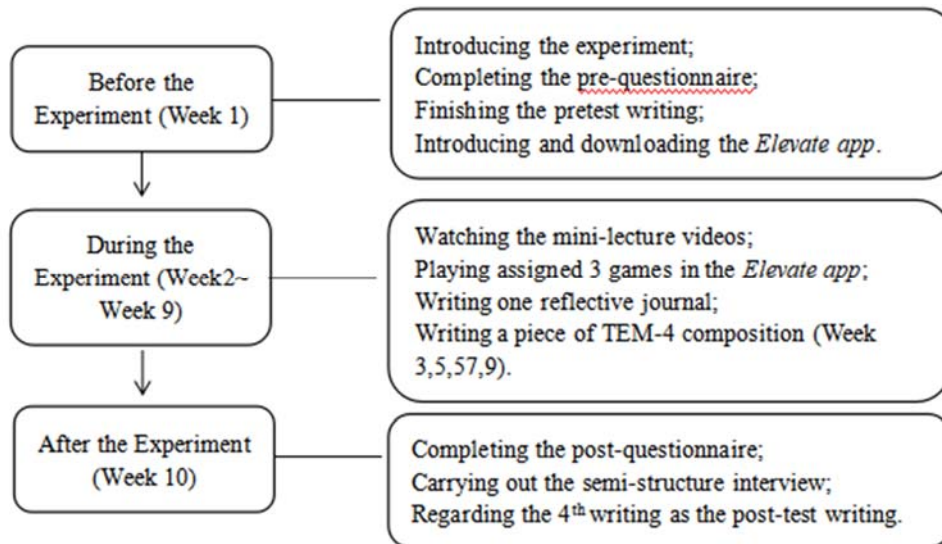


Figure 7. Procedures of the Experiment

During the experiment, both students in the EG and those in the CG received mini-lecture videos in which various common errors in English writing were presented. In order to give students comprehensible instruction, there should be well-designed instructional content and teaching plans. To understand better the teaching process of this experiment, the 4th learning cycle of the EG is taken as an example (See Figure 8).

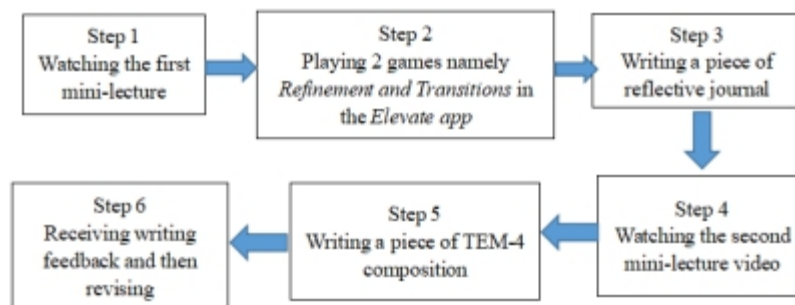


Figure 8. Demonstration of the 4th Learning Cycle

3.4 Data Collection and Analysis

In this study, four data sets were mainly collected. Firstly, scores of pretest and post-test of writing were collected and then analyzed by SPSS 22.0. Scores of *iWrite 2.0* and that of teacher feedback are consistent through Pearson Correlation. Secondly, variation of common errors in participants' composition was recorded by Excel. What's more, questionnaires before and after experiment are conducive to exploring participants' attitudes and feelings towards gamification and traditional teaching methods. Last but not least, semi-structure is an important tool for eliciting data. All interviewees were given face-to-face interviews, and the interviewer asked some detailed questions according to the interviewees' expression and body language. Meanwhile, audio recordings were used in Chinese for more clear information and then transcribed into English.

4. Results

4.1 The Effects of Gamified Learning on Promoting Students' Awareness of Common English Writing Errors

As it was shown in the results of interviews, most students admitted that gamification indeed urges them to be aware of common errors in English writing. Besides, the author also found another information which is never found in the questionnaires. Student 5 (See Table 1) thought gamification only has a positive effect on her linguistic scores. It is not suitable for her because of her poor English vocabulary, grammar knowledge and the operational

difficulties of the *Elevate app*. She seems reliant on teachers and believes it's enough to learn well as long as she finishes homework on time. However, it's not enough to play the *Elevate app* once a week for students with poor command of English. By contrast, student 6 played the *Elevate app* more than 30 times a week so that his writing scores increasingly improved in each writing test. It's clear that gamified-learning benefits learners who learn actively and initiatively.

Table 1. Views on the Effects of Gamification on Error Awareness-the Results of the Semi-structure Interview

	English Level	Performance in the experiment	Views on the effects of gamification on error awareness
Student 1	High	Active; always explain writing tasks to classmates	"I'm aware of common errors in my own English writing after the experiment. Besides, <i>Elevate app</i> facilitates me to keep the sense of language."
Student 2	Medium	Finish homework actively; seldom express opinions	"I think errors of word form, collocation and fixed usage get improved the most."
Student 3	Medium	Always make suggestions on <i>Elevate app</i> ; pay no attention to herself compositions	"I think this app improves my understanding of common errors in English writing such as verb tense, capitalization and the usage of conjunction words."
Student 4	High	Active; finish assignment well	"To some extent, my awareness of common errors has been improved. Especially Brevity and Clarity game settings help me correct some word errors. Besides, I would recall errors I made in <i>Elevate app</i> and pay attention to these problems subconsciously when I was writing in English."
Student 5	Low	Complain a lot; lack of initiative; rely on teachers	"I think gamification just help me to improve the awareness of linguistic errors."
Student 6	Low	Finish assignments passively	"After the experiment, I would think twice when I write in English such as grammatical errors which are always emerged in my own compositions."
Student 7	Medium	Active; express a lot; finish well	"I think gamification teaches me how to use cohesion and coherence which can enhance logic in my composition."
Student 8	Medium	Active; hard-working; talk less	"I think I would write a draft before writing a composition such as the structure, views and content."
Student 9	High	Active; hard-working; always communicate with students and teachers	"I think gamification is so interesting and meaningful so that I'm playing the <i>Elevate app</i> now. As for error awareness, I would remind myself of common errors before writing, and then detect and modify errors after the first writing before handing in my composition."

4.2 The Effects of Gamified Learning on Improving Students' Writing Performance

1) The Results of Students' Scores of Weekly Writing

From the above discussion, it is clearly seen that gamification can enhance students' awareness of common errors in English writing. What's more, it can facilitate students to improve writing performance which is moderated and mediated by the improvement of awareness.

Table 2. Paired Samples Statistics of Writing Performance of the EG

	Paired Samples Statistics			
	Mean	N	Std. Deviation	Std. Error Mean
Post-test-Pretest	84.3779	30	4.962	.906
	74.3225	30	3.688	.673

Table 3. Paired Samples Test of Writing Performance of the EG

	Paired Samples Test							
	Mean	Paired Differences			t	df	Sig.(2-tailed)	
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Posttest-Pretest	10.05542	5.79382	1.05780	7.89197	12.21887	9.506	29	.000

As it's shown in Table 2, there is a significant difference between writing scores in the pretest and those in the post-test for EFL students who received gamified-learning method and the traditional English writing teaching method ($t = 9.506, df = 29, p < 0.05$). The scores they got in the post-test were higher than those in the pretest ($MD = 10.05542$). It means students' writing performance and skills got improved through "gamification+ traditional way" method. In other words, it's effective for EFL students who make full use of the method. In contrast, from Table 5, it's found that there is a visible difference between writing scores for EFL students who only received the traditional English writing teaching before and after the experiment ($t = 5.588, df = 24, p < 0.05$) as well. And the scores they got in the pretest writing were also lower than those in the post-test ($MD = 3.40815$), which manifests "merely the traditional way" can also improve their writing performance and skills.

Table 4. Paired Samples Statistics of Writing Performance of the CG

	Paired Samples Statistics			
	Mean	N	Std. Deviation	Std. Error Mean
Post-test-Pretest	77.5157	25	2.30025	.46005
	74.1075	25	2.56183	.51237

Table 5. Paired Samples Test of Writing Performance of the CG

	Paired Samples Test							
	Mean	Paired Differences			t	df	Sig.(2-tailed)	
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Posttest-Pretest	3.04815	3.04961	.60992	2.14933	4.66697	5.588	24	.000

However, there is a significant difference between scores of post-writing in the EG and in the CG. The scores of the CG ($M = 74.1075$) are similar to that of the EG ($M = 74.3225$) in the pretest writing, which means they are at the same level of English writing before the experiment. Owing to two different writing teaching methods (gamification+traditional way& merely traditional way), the scores of the two groups improved to different degrees. As it's shown in Table 4.8, the mean of the EG in the post-test writing is 84.3779 ($SD = 4.962$) while that of the CG is 77.5157 ($SD = 2.30025$). It demonstrates that almost all students who received the "gamification" method got grades over 80 while students without the "gamification" method got final grades lower than 80. In other words, gamification in English writing can effectively improve students' writing performance.

2) The Results of Students' Scores in Language, Misformation, Cohesion/Coherence and Content/Organization

Gamification has positive impacts on the overall improvement of English writing scores, which rather means each part of writing performance gets significantly improved. In this section, development of students' scores and its statistic data would be shown with the help of figures in Excel and Independent Samples T Test in SPSS.

Table 6. Comparison of Respective Scores between the EG and the CG (Independent Samples T Test)

		EG(n=30)				CG(n=25)			
		MD	t	df	Sig.(2-tailed)	MD	t	df	Sig.(2-tailed)
Post-test-Pretest	Language	7.178	3.840	29	0.010	1.124	0.860	24	0.398
	Misformation	15.910	10.148	29	0.000	8.300	5.783	24	0.000
	Cohesion/Coherence	9.300	6.672	29	0.000	1.522	1.184	24	0.248
	Content/Organization	7.833	6.157	29	0.000	2.686	2.601	24	0.016

As it's shown in Table 6, there are significant differences in scores of language ($t = 3.840$, $df = 29$, $p < 0.05$), misformation ($t = 10.148$, $df = 29$, $p < 0.05$), cohesion/coherence ($t = 6.672$, $df = 29$, $p < 0.05$), and content/organization ($t = 6.157$, $df = 29$, $p < 0.05$) in the EG. It demonstrates that gamification (*Elevate app*) positively influences each part of writing performance for the EG students. Besides, gamification facilitates students to improve scores of misformation the best ($MD = 15.910$), and cohesion/coherence ($MD = 9.300$), content/organization ($MD = 7.833$) and language ($MD = 7.178$) are following. In other words, some students in the EG made several linguistic errors until the end of the experiment. While in the CG, it is merely in scores of misformation ($t = 5.783$, $df = 24$, $p < 0.05$) and in scores of content/ organization ($t = 2.601$, $df = 24$, $p < 0.05$) that there is significant difference. In other words, there are no significant differences in scores of language ($t = 0.860$, $df = 24$, $p > 0.05$) and cohesion/coherence ($t = 1.184$, $df = 24$, $p > 0.05$) in the CG. These data make a valid point that the traditional way could improve scores of misformation ($MD = 8.300$). But the traditional way has less impact on scores of language ($MD = 1.124$) and cohesion/coherence ($MD = 1.522$), which perhaps needs a longer time.

First and foremost, the development of scores at linguistic level would be shown through the comparative analysis of the EG and the CG (See Figure 9). The comparison of them manifests that scores of the EG students were improved faster than those of the CG students in terms of language. Besides, students in the EG improved their language scores a lot in each test writing, while there are slight changes in language scores in the CG.

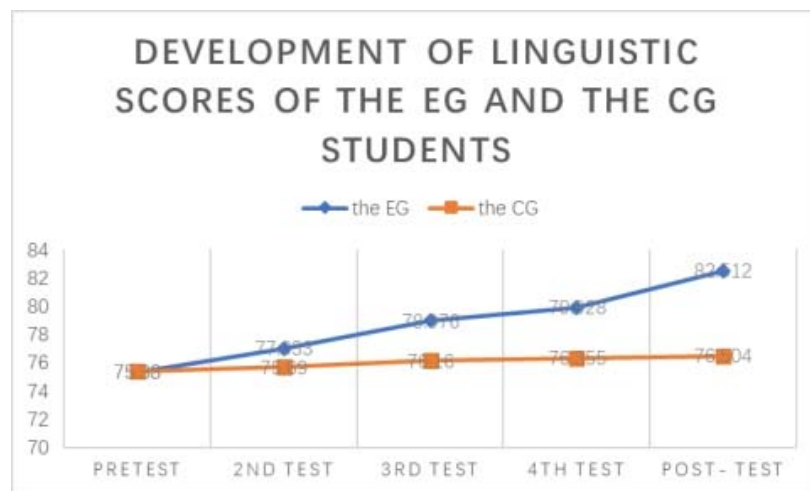


Figure 9. Comparison of Linguistic Scores in the EG with the CG

As for misformation, “gamification+ traditional way” and “merely traditional way” both improve scores a lot. It means misformation like spelling, capitalization and punctuation is easily enhanced for EFL students. But misformation scores of all students were lower in the pretest writing. What's more, the average score of the EG students is higher than that of the CG students (See Figure 10). In other words, game settings in the gamification (*Elevate app*) can increasingly deepen students' impression or memorization of misformation knowledge.

Comparing the development figure of language scores and misformation scores, the author found that language and misformation were improved at once after the first experimental teaching. It means that knowledge of common errors in English writing is one of students' knowledge gaps, which is needed for EFL students.

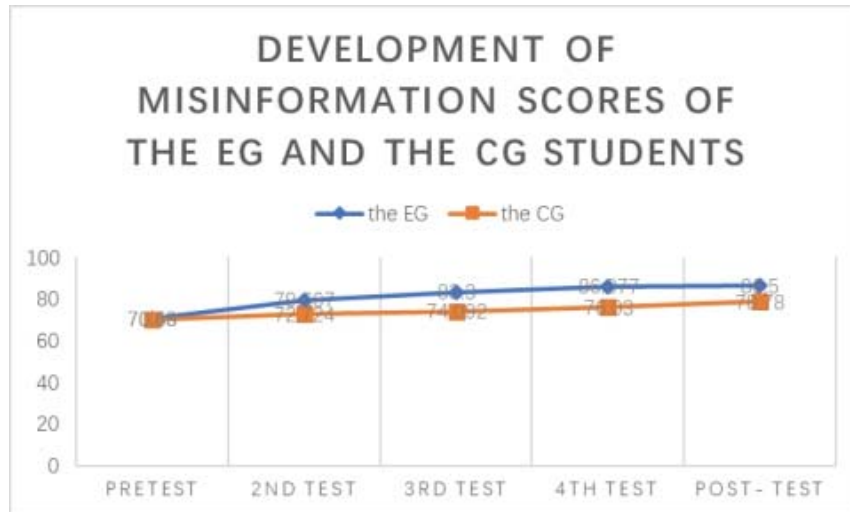


Figure 10. Comparison of Misformation Scores in the EG with the CG

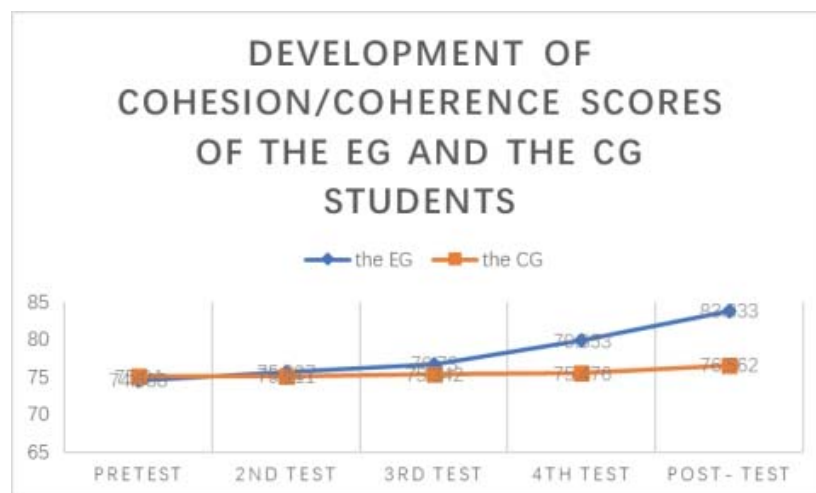


Figure 11. Comparison of Cohesion/Coherence Scores in the EG with the CG

Additionally, EG students get higher scores than CG students' in terms of cohesion/coherence in the latter two test writing (See Figure 11). It's obviously found that scores of these two groups are similar in the former three test writings. It interprets that gamification (*Elevate app*) in the former two experimental teaching improved this aspect a little. In other words, game settings in the *Elevate app* play different roles in different aspects of writing performance, which means the third and the fourth weeks of experimental teaching have played vital roles in the improvement of cohesion/ coherence scores.

Although content/organization scores of the EG students are higher than those of the CG students, their scores of the fourth test writing are lower than those of the third writing (See Figure 12). It means there are other factors influencing students' scores, such as the topic of the fourth composition. Besides, most language learners believe that content and organization are not easily improved in a short time. However, gamification facilitates students to be aware of common errors in content and organization, and offers interpretation and exercises in a gaming way. In this way, students feel it is interesting, fun, motivating, targeted and meaningful rather than boring, tiring and playful.

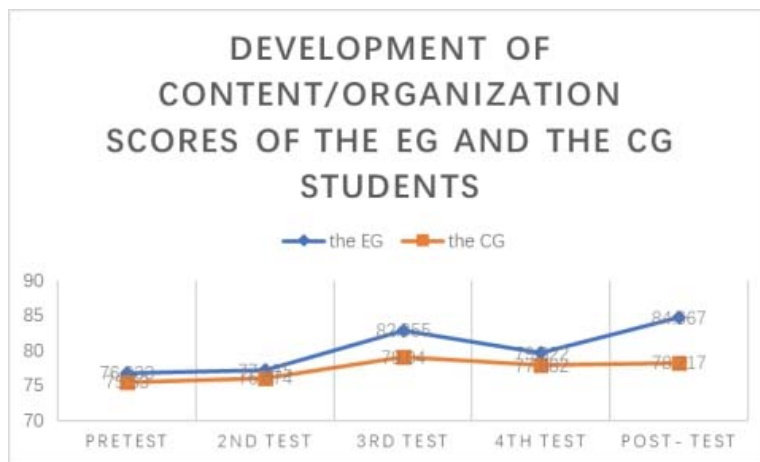


Figure 12. Comparison of Content/Organization Scores in the EG with the CG

3) Students’ Perceptions of Gamified Learning in College English Writing and of Traditional Teaching Method

Table 7. Students’ Attitudes towards Gamification before the Experiment

Items	M	SD
1.我认为将英语写作的常见错误相关知识与游戏结合，一定很有趣。	2.133	0.806
2.我认为游戏化移动学习是英语写作学习的有效方法之一。	3.267	0.772
4.如果将英语写作常见错误游戏化，我会更加集中精力的去学习。	3.167	0.643
5.如果将英语写作常见错误游戏化，我会更加有信心去提高我的英语写作水平。	3.433	0.761
7.与传统的英语写作教学相比，我更喜欢游戏化英语写作学习。	2.867	0.716
8.如果将游戏化学习与课堂教学结合起来，我会听课更认真。	2.967	0.716
9.游戏化移动学习有利于我对英语写作学习的理解。	3.033	0.795
10.我支持教师将英语写作课堂教学的某一环节与游戏化移动学习相结合。	1.800	0.792

As is shown in Table 7, the means of most questions are more than 2 except the tenth question. It shows that most students were not sure whether gamification applied in English writing was effective to writing performance or not at the beginning of the experiment. Especially for question 4 (M = 3.433, SD = 0.716), 2 (M = 3.267, SD = 0.772) and 5 (M = 3.167, SD = 0.643), most students were not sure and doubtful about the effectiveness of gamification on English writing. Besides, the mean of the tenth question is 1.800 (SD = 0.792), which means most students supported gamification in English writing method and were willing to test this method. In other words, most students think the traditional English teaching method lacks fun and specialization.

Table 8. Students’ Attitudes towards Gamification after the Experiment

	Cognitive Strategy (n=30)		Meta-cognitive Strategy (n=30)		Affective Strategy (n=30)		Social Strategy (n=30)	
	M	SD	M	SD	M	SD	M	SD
The EG	1.833	0.791	1.433	0.716	2.067	0.691	2.167	0.747

After the experiment, students’ attitudes towards gamification have changed a lot (See Table 8). 42 items were included in the post-questionnaire and designed from the perspectives of cognitive strategy, meta-cognitive strategy, affective strategy and social strategy. The mean of the former strategies is lower than 2 (M = 1.833, M = 1.433), which means most students have acknowledged the effectiveness of gamification on English writing after using *Elevate app*, whereas the means of latter strategies are less than 2 (M = 2.067, M = 2.167), which manifests students seldom asked others for help such as peers and teachers. Besides, the mean of affective strategy is 2.067 (SD = 0.691), which indicates that several students felt anxious about English writing learning in the process of playing *Elevate app*.

5. Discussion

First of all, all the qualitative data shows that gamification (*Elevate app*) can enhance students' awareness of common errors in English writing. In fact, the traditional way has positive impacts on error awareness as well. However, there exist fundamental differences between gamification and the traditional way of English writing. Combined with the results of respective scores in all test writings, the improvement of error awareness of students who received gamification has moderated the direct influence of the explanation of common errors in English writing on the writing performance or scores (A-C-B), and has mediated the relationship between the game elements in *Elevate app* and writing performance or scores (D-C-B) (See Figure 13). In this way, students in the EG could improve their writing scores more effectively than those in the CG. The reasons why error awareness of students has been improved are likely to rely on the instructional content (explanation in *Elevate app* and the given videos) and game elements in the app. (See Figure 13).

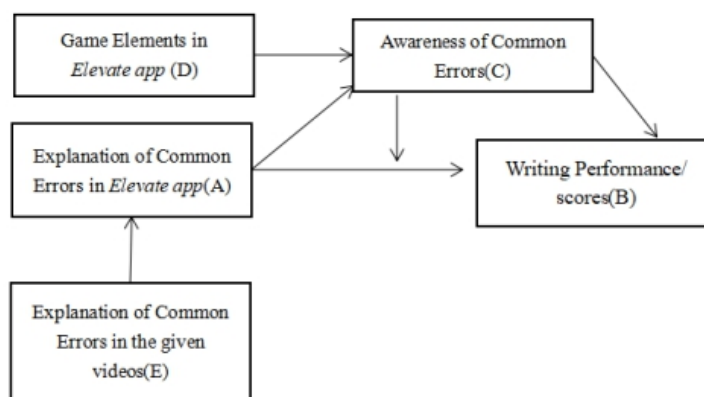


Figure 13. The Process of Gamified-learning (*Elevate app*) in English Writing in this Study

On the one hand, the influence of the instructional content (A+E) on error awareness is interpreted below. Additional explanation of common errors in English writing were included in this study as supplements to explanation in *Elevate app*, which is different from Landers' studies (2014, 2017). Several students believe that there is no Chinese explanation in the *Elevate app* which offers students "immersion method" of English learning. Therefore, awareness of common errors could be influenced by two explanations inside app and outside app (E+A-C). Before playing one game on the app, there is a detailed but brief introduction of one common error. And there is a video demo at the right bottom that you can choose to watch it or not before entering educational games. Besides, the explanation given by video supplements knowledge of common errors in the app is Chinese. In accordance with Landers (2014), the instructional content should help students to learn properly, otherwise the content never has positive impacts on the learning output. Therefore, the instructional content positively influences students' awareness of common errors in English writing.

On the other hand, error awareness is improved by game elements in *Elevate app*. There are some game elements in this app, for which students feel it interesting, fun, motivating, targeted and meaningful. Firstly, "Achievements/Objectives" setting can facilitate students to compare their error awareness to mini-goals in each game, and then narrow down the gap through adjusting their behaviors. Secondly, "Levels, Points, Leaderboards, Badges, Virtual goods and Gifting" settings can intrinsically motivate students to engage in games and enjoy this process of learning with gaming. In addition, "freedom of choice, freedom to fail and immediate feedback" settings prolong students' time in playing games in *Elevate app*. Landers, R. N. and Landers, A. K. (2015) investigated that time-on-task can improve academic performance in certain situations. One interviewee of nine (Student 7 in the Table 7) in the present study wrote in his reflective journal, "I have played these three games 47 times..." As a result, his writing score of post-test writing is 20 points higher than his score of the pretest writing, and his language, misformation, cohesion/coherence, and content/ organization scores have been improved respectively (See Figure 14).

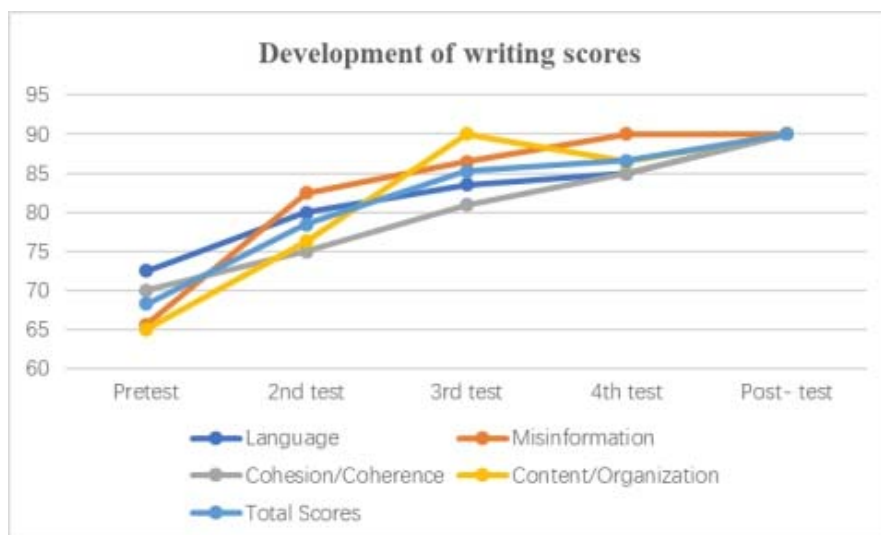


Figure 14. Development of writing scores of student 7 whose improvement of error awareness partly depends on time-on-task

Secondly, quantitative data makes a valid point that gamification can improve the whole writing performance and skills of EFL students. Especially for students who have strong self-control and self-determination, they are willing to spend more time playing *Elevate app*. Based on the analysis of qualitative data, students are aware of common errors when they are writing in English. The error awareness could be considered as students' positive attitudes towards game elements and the instructional content. The enhancement of error awareness could be conducive to the improvement of writing performance, during which error awareness moderates and mediates relationships among game elements, instructional content, and writing performance. Not only can gamification improve the whole writing performance, but it also improves scores in language, misinformation, cohesion/coherence and content/organization.

“Gamification+traditional way” and “traditional teaching way” can both improve misinformation scores a lot. Spelling, capitalization and punctuation are the basic knowledge in English, which is easier for college students to correct. Besides, it proves that for EFL students these errors are never new ones but errors that they always make subconsciously. In other words, students need to receive explanation of common errors in English writing courses, which supplements their knowledge gaps in English. According to the results of the post-test writing, students in the EG have never made misinformation errors again. However, several students in the CG still make such errors. For example:

- 1) Nowadays, internet has become the part of people' life... (Zhou, from the CG)
- 2) With various patterns of consumption emerging we are seemingly willing to spend more money in raising the standard of our life in different areas... (Du, from the CG)

In the first sentence, this student made errors in capitalization and article: “internet” should be corrected as “the Internet”. In the second sentence, a comma should be added into the middle of “emerging” and “we”. These errors were interpreted and emphasized in the traditional teaching videos, exercises and writing feedback. Given that gamification can deepen students' impression that students should capitalize letters, and add or delete punctuation under proper circumstances, various errors of punctuation are particularly explained carefully in the *Elevate app* such as the usage of dash. Most students believe that the dash could be used casually, but in fact it plays different roles in different situations. Such trivial errors are sometimes ignored in teacher feedback, which really offers students a false impression that how they use dash is not that important.

Besides, students' awareness of cohesion/coherence and scores in this aspect improved after gamified-learning. Most students believe that some game settings such as “Refinement” in *Elevate app* can interpret how to use cohesion/coherence device in English writing. And most of them thought it's interesting to learn it through gaming rather boring. As for content/organization, “Error Avoidance” in *Elevate app* explains how to express your thoughts in detail and briefly. Most students in the EG are able to express one topic from different dimensions. Most importantly, they never repeat similar sentences in the latter test writings. According to figures in 4.2.2, it's not hard to find that the development of cohesion/coherence, content/organization scores in the EG are the same

as that in the CG in the former two test writings. But in the next writings, there are prominent differences between students' scores in the EG and those in the CG. It is partly attributed to the fact that game settings in the next teaching experiments involve knowledge of cohesion/coherence and content/organization. What's more, scores of content/organization are related closely to the topic of writing, which helps students to get higher scores. For example, the topic of the third test writing was adopted from TEM-4 writing in 2008, "The Benefits of Volunteering", which is relevant to students' life.

1) ... why do you think you got a higher score in the third writing? (Interviewer added a question according to what the interviewee said before)

2) (Firstly), I think this topic is related to my daily life. I always take part in various volunteering activities, partly for the requirements of our university. (Secondly), I think there are some examples and exercises about volunteers in the Elevate app. I can imitate TP patterns, coherence devices, and structure of some expressions in this app. (One interviewee, from the EG)

Last but not least, students' scores in the linguistic aspect also got improved, though the progress is not as swift as expected. The linguistic errors include word choices and grammatical errors. Most students in the EG felt that their error awareness of word choices has been improved. And in the writing feedback, there are few errors of word form, collocation and fixed expression made. For instance, most students didn't use "not only... but also" properly. They knew this fixed expression should be inverted, but they didn't know how to invert. As a result, they always made a Chinglish expression. But now they use it fluently and confidently after learning it from the *Elevate app*. According to all the writing feedback of the EG students, most students got lower scores in language for grammatical errors such as subjective-verb agreement. For example,

1) The reasons why I think saving money is approved has three parts. (One student from the EG)

Based on the qualitative data, most students held positive attitudes towards gamification in English writing. They strongly support that teachers can add explanation of common errors and gamified-design into English writing classrooms. Besides, with the help of gamification they didn't ask others for help as often as before. Game settings are interesting, targeted and competitive so that students are motivated to get higher scores in each game of *Elevate app*. A few students agree that gamification has positive impacts on error awareness and writing performance, but they disagree that gamification is applied into English writing classroom. It is similar to the results of Tantawi, Sadaf and Alhumaid's study (2016) that satisfaction with playing games is associated with the outcomes of English writing, but minimal students are willing to play it in the whole semester. All students admit gamification can improve writing performance, but not all students agree to apply *Elevate app* into English writing classroom. The reasons are illustrated as follows. Students believe that gamification is so competitive that they want to play it all the time till over-topping peers' scores, that it is, gamification is time-consuming. They suggested that gamification is not used in the classroom but can be used after-school as one of homework. Besides, students thought that *Elevate app* was a learning game app after all, not as interesting as other fun game apps on the cell phone. When they want to play it, it is quite likely that they need to resist the temptation of playing other playful games. In other words, there are certain limitations to gamification applied in English writing.

To sum up, gamification is primarily suitable for students who have strong self-control and self-determination. It is important for students to learn through gaming willingly. Besides, gamification designers or teachers should design instructional content and game settings according to different types of students. Landers et al. (2017) pointed out that self-control and self-determination can moderate the influence of game elements on learning outcomes. Goal-setting is a significant application of self-determination which means goals are created to maximize learning outcomes. Therefore, mini-goals are needed in gamified-learning in English writing. In the present study, mini-goals urge students to overcome challenges one by one with the purpose of the improvement of error awareness and of writing performance at last, in accordance with SMART goals (Landers et al., 2017): specific, measurable, attainable, realistic and time-bound. Additionally, challenges designed in the *Elevate app* are "difficult" and "acceptable" for students. If challenges and mini-goals are so easy, students would lack the sense of satisfaction and motivation to keep playing. If they are too difficult, students would feel them demotivating and impossible. Through empirical exploration, the study proves that gamification is effective in improving error awareness directly, and has positive impacts on writing performance and skills indirectly.

6. Conclusion

The prominent purpose of this study was to determine the effectiveness of gamification in improving awareness of common errors in English writing and writing performance. Three conclusions arrived in this study. First of all, game elements and instructional content given in game settings by the *Elevate app* have positive impacts on error awareness for EFL students. Secondly, gamification could improve students' writing performance and correct

positively common errors in English writing like linguistic errors, misformation, errors of cohesion/coherence, and errors of content/organization. On the one hand, the enhancement of error awareness moderates the process of instructional content influencing the writing performance. During this moderating process, error awareness as moderators do not influence writing performance independently because of the causal construct. Instead, game elements played an important role in this moderating process, which makes students more motivated and engaged to learn knowledge of common errors in English writing through gaming. Furthermore, the improvement of error awareness facilitates mediating the contribution of game elements to the development of writing performance. In the *Elevate app*, error awareness could mediate the interrelationships between game elements and writing performance (learning outcomes). Meanwhile, error awareness is influenced by the instructional content. Therefore, the moderating process and the mediating process both play significant roles in the improvement of students' writing performance. Thirdly, "gamification and traditional way" and "traditional teaching way" both have positive impacts on error awareness and writing performance. But there is a stronger connection between error awareness and writing performance in "gamification and traditional way" method, whose effectiveness is reflected by the scores of each test writing as seen in the statistics in questionnaires, reflective journals and interviews. By contrast, "the traditional teaching way" can make students become aware of common errors in English writing, but its contribution is less reflected in writing performance.

There are several pedagogical implications for English writing teaching that can be drawn from the study. The contributions of gamification and traditional teaching methods to the improvement of English writing are clear and obvious from the results. The explanation of common errors in English writing can narrow down students' knowledge gaps, which are conducive to the understanding of teacher feedback. Gamification has effectively improved students' awareness of common errors, and then has motivated students to intrinsically correct these errors through gaming.

7. Limitations

Although this study determined the positive effectiveness of gamification on students' awareness of common errors and writing performance, there still exist several limitations needed to classify. Besides, several suggestions for future studies on gamification applied into English writing are presented as follows. Firstly, the sample size should be larger. Secondly, the duration of the intervention should be longer as it lasted only 10 weeks in this study. In addition, teacher feedback should be given by two experienced teachers in which the reliability of writing feedback becomes higher and more convincing.

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Authors' contributions

Sample: Cheng Lei Wang and Qiangqiang Li were responsible for study design and revising. Qiangqiang Li was responsible for data collection and drafted the manuscript and Cheng Lei Wang revised it. All authors read and approved the final manuscript.

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No additional data are available.

References

- Al-khresheh, M. (2010). Interlingual interference in the English language word order structure of Jordanian EFL learners. *European Journal of Social Sciences*, 16, 105–116.
- Corder, S. P. (1967). The significance of Learner's Errors. *International Review of Applied Linguistics*, 5(1–4), 161–170. <https://doi.org/10.1515/iral.1967.5.1-4.161>
- Corder, S. P. (1974). Idiosyncratic dialects and EA. In J. C. Richards (Eds.), *EA: perspectives on second language acquisition* (pp. 158–171). London: Longman.
- Dai, W. D., & Shu, D. F. (1994). Problems in CA, EA, and IL theory research-A theoretical study of foreign language teaching (In Chinese). *Journal of Foreign Languages*, 5, 1–7.
- Deterding, S. (2012). Gamification: Designing for Motivation. In J. McCarthy (Ed.), *Interactions: Social Mediator Forum*. <https://doi.org/10.1145/2212877.2212883>
- Deterding, S., Dixon, D., Khaled, R., & Nackle, L. (2011). *From Game Design Elements to Gamefulness: Defining "Gamification"*. Proceedings of Mind Trek 2011. September 28–30. Tampere. Finland. <https://doi.org/10.1145/2181037.2181040>
- Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in Education: A Systematic Mapping Study. *Educational Technology & Society*, 5, 1–14. <https://doi.org/10.1515/cait-2014-0007>
- Du, J. B. (2001). Exploring English writing teaching from errors in students' compositions (In Chinese). *Foreign Language Education*, 22(2), 43–47.
- Ellis, R. (2009). The differential Effects of three types of task planning on the fluency, complexity and accuracy in L2 oral production. *Applied Linguistics*, 30(4), 474–509. <https://doi.org/10.1093/applin/amp042>
- Kapp, K. (2012). *The gamification of learning and instruction: Game-based methods and strategies for training and instruction*. San Francisco: Pfeiffer. <https://doi.org/10.1145/2207270.2211316>
- Karim, A., Mohamed, A. R., Rahman, M. M., & Shahed, F. (2018). EA in EFL Writing Classroom. *International Journal of English Linguistics*, 3, 122–138. <https://doi.org/10.5539/ijel.v8n4p122>
- Kim, B. (2015a). Gamification: Examples, definitions, and related concepts. *Library Technology Reports*, 51(2), 10.
- Koutropoulos, A., & Porter, J. (2020). *Gamification in Education*. Gamification: Games, Enabling Technologies, and Applications.
- Landers, R. N. (2014). *Developing a Theory of Gamified Learning: Linking Serious Games and Gamification of Learning*. <https://doi.org/10.1177/1046878114563660>
- Landers, R. N., Armstrong, M. B., & Collmus, A. B. (2017). How to Use Game Elements to Enhance Learning: Application of the Theory of Gamified Learning. *Serious Games and Edutainment Applications*, 3, 3–4. https://doi.org/10.1007/978-3-319-51645-5_21
- Landers, R. N., & Landers, A. K. (2015). An empirical test of the theory of gamified learning: the effect of leaderboards on time-on-task and academic performance. *Stimulation & Gaming*, 45(6), 769–785. <https://doi.org/10.1177/1046878114563662>
- Larenenko, N. V. (2017). Enhancing English Language Learners' Motivation Through Online Games. *Information Technologies and Learning Tools*, 59(3), 126–133. <https://doi.org/10.33407/itlt.v59i3.1606>
- Li, Y. B., Song, J. Y., & Yao, Q. H. (2019). Research on Influence of Gamification Learning Method on Students' Learning Effect: Meta-analysis Based on 35 Experiments and Quasi-experimental Studies (In Chinese). *Audio-Visual Education*, 40(11), 56–62.
- Lin, S. E., Chen, L. Y., & Chang, K. L. (2020). A Comparison of the English Grammatical Errors of Chinese Undergraduates from China and Malaysia. *International Journal of Instruction*, 4, 931–950. <https://doi.org/10.29333/iji.2020.13160a>
- Ling, Q., Wang, H., & Wang, Z. H. (2019). Study on the effectiveness of gamified mobile learning in vocabulary learning of college English learners. *Computer-assisted Foreign Language Education*, 6, 9–15.
- Naama, A. N. (2019). *The college learners' errors of English writing: A case study of EA*. Conference: Third

- international conference entitled cooperation and coordination among governmental and private institutions.
- Ocriciano, M. (2016). IELTS writing: a gamification journey. *Cambridge English: Research Notes*, 64, 31–38.
- Tantawi, M. E., Sadaf, S., & Alhumaid, J. (2016). Using gamification to develop academic writing skills in dental undergraduate students. *European Journal of Dental Education*, 22, 15–22. <https://doi.org/10.1111/eje.12238>
- Wiethof, C., Tavanapour, N., & Bittner, E. A. C. (2020). *Design and evaluation of a collaborative writing process with gamification elements* (p. 43). ECIS 2020 Research Papers.
- Yavuz, F., Ozdemir, E., & Celik, O. (2020). The effect of online gamification on EFL learners' writing anxiety levels: A process-based approach. *World Journal on Educational Technology: Current Issues*, 12, 062–070. <https://doi.org/10.18844/wjet.v12i2.4600>

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