

## บทความวิจัย (Research Article)

การพัฒนาความสามารถการอ่านภาษาอังกฤษและการมีส่วนร่วมของผู้เรียน  
ที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศโดยการจัดการเรียนรู้แบบสื่อประสม  
Increasing EFL Students' English Reading Ability and Engagement  
through Multimodal Learning Environments

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## บทคัดย่อ

การอ่านเป็นทักษะที่สำคัญ แต่กลับเป็นเรื่องยากที่จะทำให้ผู้เรียนต้องการอ่านภาษาอังกฤษทั้งในและนอกห้องเรียน การวิจัยนี้มีวัตถุประสงค์เพื่อส่งเสริมให้ผู้เรียนมีส่วนร่วมในการเรียนการอ่านภาษาอังกฤษโดยศึกษาผลของการจัดการเรียนรู้แบบสื่อประสมที่มีต่อความสามารถด้านการอ่านในชั้นเรียนที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศและทัศนคติที่มีต่อการอ่านภาษาอังกฤษ เพื่อให้ได้ผลที่ถูกต้องและเชื่อถือได้ จึงดำเนินการวิจัยที่มหาวิทยาลัยสองแห่งที่มีความแตกต่างกัน คือที่กรุงเทพมหานครและที่จังหวัดนครปฐม ผู้เข้าร่วมวิจัยเป็นนักศึกษาระดับปริญญาตรี จำนวน 64 คน เครื่องมือที่ใช้ในการวิจัยได้แก่ แผนการสอนแบบทดสอบความสามารถด้านการอ่าน และแบบสอบถาม สถิติที่ใช้ในการวิเคราะห์ข้อมูลได้แก่คะแนนเฉลี่ย ค่าเบี่ยงเบนมาตรฐาน การวิเคราะห์ความแปรปรวนแบบสองทาง และสถิติทดสอบที ผลการวิจัยของทั้งสองที่มีความสอดคล้องกัน กล่าวคือความสามารถการอ่านภาษาอังกฤษของผู้เรียนในกลุ่มทดลองสูงกว่านิสิตในกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ และยังพบอีกว่าทัศนคติที่มีต่อการอ่านภาษาอังกฤษของผู้เรียนในกลุ่มทดลองสูงกว่ากลุ่มควบคุม มีความสอดคล้องกันของผลการวิจัยของทั้งสองที่แสดงว่าการจัดการเรียนรู้แบบสื่อประสมสามารถพัฒนาการเรียนรู้ทั้งผู้เรียนที่มีความรู้ในระดับสูงและระดับต่ำ อีกทั้งยังส่งเสริมการเรียนรู้ของผู้เรียนที่มีภูมิหลังที่แตกต่างกันอีกด้วย

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## Abstract

Reading is considered a crucial life skill; however, it is difficult to motivate students to read inside or outside the English as a foreign language (EFL) classroom. This research study was designed to engage EFL students in a reading class, investigating the impact of multimodal learning environments on EFL students' reading ability and its relationship to their attitudes towards English reading. To ensure accuracy and reliability of results, the experiment was conducted at two universities in different locations: Bangkok and Nakhon Phathom. The participants were 64 undergraduate students. The instruments used in this study included lesson plans, a reading test, and questionnaires. Mean scores, standard deviations, two ways analysis of variance, and a t-test analysis were used to analyze the data. The results from both locations were similar specifically students in the experimental groups had significantly higher reading test scores and more positive attitudes towards English reading than those of the control groups, indicating that multimodal learning environments were effective in EFL classes. This consistency of findings at both universities confirms that multimodal learning environments facilitated both high-and low-achieving students' learning and supported students with different backgrounds.

**Keywords:** Multimodal learning environments, Reading ability, Attitudes

## Introduction

According to the Ministry of Education, Thai students should be exposed to useful learning processes and strategies to enhance social and academic use of English. To meet these goals, education policy states that Thai students must be able to reason, critique, and acquire and apply problem-solving skills in real life situations (The Office of the National Education Center, 1996). In addition, The ASEAN Economic Community (AEC), launched in 2015, intends to open up a free labor market between the ten ASEAN member countries; as a result, professionals and skilled workers with advanced English language proficiency have an advantage during job seeking because English is the common medium for international communication in both public and private sectors. Consequently, strong English language skills, especially reading, are necessary for Thai students if they are to gain maximum advantage of the 2015 AEC opportunities.

However, research reveals unsatisfactory levels of reading ability among Thai students. For example, Nitsaisook (2002) found that both Thai secondary and tertiary students, on average, performed poorly in English reading ability. She also pointed out that the result

reflected the general quality of English instruction in Thailand. Thai educators investigated the reading ability of Thai EFL students and found that most Thai university EFL students, especially those who were not English majors had low to medium English reading proficiency (Anusornorakarn, 2002; Chinwonno, 2001; Rattanawanitpun, 1999). Many studies have revealed that activities were predominantly teacher-centered (Chareonwongsak, 2002: 4; Tolley et al., 2012: 382; Kullberg, 2010: 136); Kullberg (2010) found that the most common teaching method was recital teaching (or recital method), wherein the teacher speaks and students repeat using a recitation voice. This learning style was rote-learning and often led to a lack of interest and interaction. Kullberg concluded that Thailand had not yet met their educational goals for English language. Jenson (2005: 34-36) stated that increasing students' engagement and involvement in classrooms is important. Therefore, Thai English teachers need to improve their knowledge of teaching methods and motivational strategies (Kullberg, 2010: 137).

Dunn & Griggs (2003: 146) contends that students learn differently and that typical classrooms are not a good learning environment for many students. Merrill (2002) found that learning environments where students interact and are engaged in class activities help improve achievement. Rapid technological development has led to considerable change in communication that has significantly influenced the learning environment. As students are currently exposed to science and computer technology, teachers can use information and communication technology (ICT) to develop creative activities that appeal to students' interests. The quick transition from print to more visually oriented presentations of information also involves a quick response from teachers and educators, particularly in taking advantage of multimodality to engage learners in meaningful cognitive, social, and critical understandings. Many scholars have discussed the benefits of Multimodal Learning Environment (MLE) in the classroom. For example, Bradwell (2009: 49-50) states that the ideal for teaching in higher education is to go beyond lectures to provide information. Many studies found that MLE maintained students' attention and increased content knowledge (Fadel, 2008; Ganapathy & Seetharam, 2016; Sankey et al., 2010). However, the researcher has not found the studies on MLE in Thailand yet. Based on the facts about unsatisfactory levels of Thai students' reading ability discussed above, a corrective approach to teaching reading in English is necessary. MLE might be a good alternative. Therefore, this study was to investigate the impact of MLE on EFL students' reading ability and its relationship to their attitudes towards English reading.

## Research Objectives

1. To investigate the effect of MLE on EFL students' reading ability.
2. To investigate the effect of MLE on EFL students' attitudes towards English reading.

## Scope of the Study

This study focused on developing EFL students' reading ability and attitudes towards English reading through MLE. It used a pretest-posttest experimental-research design. The study was divided into two phases, conducted at two locations: the first was conducted at a university in Bangkok (UB) and the second at a university in Nakhon Pathom (UN). These two universities were selected via purposive sampling. The participants were 64 Thai undergraduate students in 2017 academic year.

## The Concept of Multimodal Learning Environments

The term multimodal was coined by members of the New London Group in 2000 (Lauer, 2009: 227) to explain how communication is not limited to one mode (e.g., visual) or realized through one medium (e.g., a text). MLE are based on principles of the multimodal approach, a style of teaching in which information is presented in many modes (e.g., visual and auditory; Chen & Fu, 2003: 361). In MLE class, instructional elements are presented through more than one sensory mode (visual, aural, written), using multimedia and ICT to develop dynamic classroom resources that appeal to different sensory modes and learning styles (Sankey et al., 2010: 853).

MLE highlights the importance of multiple modalities in real learning environments. Learners select or negotiate information and the meanings conveyed from modalities to construct conceptions about the world. Each modality covers a different aspect of phenomena, potentially challenging prior conceptions of the world and providing resources to imagine and think with (Kress & van Leeuwen, 2001: 45). In fact, instructors often use gestures with speech to draw attention to images and other references within the classroom. In other words, in a classroom, various modes-gestures, images, speech, and objects-interact and interplay, and each mode contributes to meaning construction (Kress & van Leeuwen, 2001: 60).

Research supports MLE. Presenting information through a variety of modes helps learners feel comfortable in the classroom and increases attention, leading to improved learning, especially for low achievers. Shah & Freedman (2003) found that MLE engaged

learners in classroom activities by making the information more attractive and motivating. Similarly, Fadel (2008) found that learners involved in MLE outperform students taught by traditional approaches with a single mode. In addition, students showed in-depth learning when a combination of modes was used, rather than only words (Mayer, 2003). MLE support knowledge acquisition by providing students with the opportunity to find information that most effectively matches their learning styles (Chen & Fu, 2003; Moreno & Mayer, 2007; Sankey et al., 2010). For example, if students fail to understand written words, a visual presentation might help communicate a concept. In addition, the interaction among teachers, students, input materials and classroom environments are significant in learning acquisition (Jewitt, 2006). To engage students in learning, teachers need to relate information to students' everyday life, and MLE can serve this purpose (Daniels, 2001).

McCarthy (2001) summarizes controversial positions regarding language learning in teaching a foreign language. The psycholinguistic perspective is based on the conception of language as an abstract system of rules where the child is a "little linguist" who can discover these rules after having some basic exposure to a given language. Thus, from this perspective, language is a cognitive phenomenon, the product of the individual's brain. On the other hand, the sociolinguistic perspective emphasizes the social function and purpose of language. That is, it is fundamentally a social phenomenon, acquired and used interactively in a variety of contexts for myriad practical purposes. Farias et al. (2011: 145) believe that these two views are not mutually exclusive; multimodality can help design an immediate surrounding analogous to contexts where parents and their child interact and negotiate meanings with the child's mind. As a consequence, multimedia presentations can serve to create a pseudo-natural environment in which these negotiations of meaning become the platform or scaffold through which second-language acquisition can occur.

In a MLE classroom, the instructor employs a variety modes of presentation. For example, he/she might use audio enhanced PowerPoint slides, video presentation, interactive graphs and forms, still images, visualized poetry, digital storyboards, process-drama, and comic-book creation. In these examples, additional presentations of information provide text-based explanations. Lorence (2008) suggests that in MLE, instructors should: 1) Change the activity every 15 or 20 minutes. 2) Repeat the lesson in multiple modes to reinforce the learning. 3) Create supplementary activities if necessary because they can remedy students who do not understand the content immediately.

The studies on MLE are increasing. For example, Sankey et al. (2010) studied the impact of multimodal representations of content on learning outcomes, at the University of Southern Queensland in Australia. It was found that although this technique did not lead to discernable improvements in learning performance, students favored the teaching method. In addition, Lee (2014) investigated the impact of multimodal English writing tasks on two case-study students. It was found that the MLE enhanced the two students' motivation and confidence after being discouraged by conventional language learning instructions. Recently, Ganapathy & Seetharam (2016) investigated effects of the multimodal approaches on literacy in meaning-making among 15 students in a school in Penang, Malaysia. The results showed that multimodal approaches promoted positive learning outcomes among students.

In the field of teaching reading, Shepard (2013) investigated teaching approaches used by English teachers in a Hong Kong primary school in reading classrooms. The aim was to determine which teaching approaches, multimodal and/or traditional, were being employed more frequently in the classroom, and which were considered by teachers to be more effective for developing literacy in primary school students. The results showed a clear preference by the teachers towards a multimodal approach in reading lessons and a decrease in a traditional method.

## Methods

The participants comprised 64 Thai undergraduate students at two universities in different geographical locations in Thailand: Bangkok and Nakhon Phathom. Purposive sampling was used for locations, as the selection of participants from different environments and cultures would ensure the reliability and accuracy of results. In addition, students in these two universities had different knowledge of English: students in Bangkok took more advanced courses and demonstrated higher proficiency while those in Nakhon Phatom had lower proficiency, based on their entrance examination scores. Participants at each university were randomly assigned to the experimental and the control groups.

The instruments were lesson plans, an English reading ability test and questionnaires. Lesson plans to teach English reading using MLE and through a traditional method were created. To design the lessons, methods for teaching reading were adapted from Woolley (2010) COR framework, based on three levels of cognition: stepping forward (Consider), stepping into (Organize), and stepping back (Reflect). Newly learnt knowledge is used progressively and cumulatively at each stage. The activities in the Consider stage include

skimming, scanning, teaching vocabulary, and predicting. For the Organize stage, the activities suggested are clarifying, questioning, and graphic organizing. In the final stage, the activities can be summarizing, creating, and relating to the real life (Woolley, 2010).

Therefore, teaching activities using MLE were divided into three stages: before-reading, during-reading, and after-reading. In the pre-reading stage, the instructor introduced students to the topic of reading using movies, songs, or advertisements related to the reading passages and then discussed the topic with students. The instructor also provided necessary background and taught new vocabulary using PowerPoint slides with pictures. In the second phase, during-reading, students read assigned passages and completed comprehension exercises such as answering true or false questions or filling in blanks on a diagram or a graphic organizer. The instructor then discussed the passages with students using PowerPoint slides designed with different colors, diagrams, and pictures. The instructor also equipped students with reading strategies using PowerPoint slides. In the final stage, students performed activities in many modes such as writing an e-mail to one of their classmates or creating visual art materials related to the passage read in class. The teaching process of the traditional method was similar to the lesson plans for teaching reading using MLE, but it involved only one mode to present information: printed texts.

An English reading ability test was developed to compare the reading ability of students in the experimental and control groups before and after the experiment. Tasks included identifying topics, main ideas, references and author's objectives, as well as scanning and guessing the meaning from context.

In addition, questionnaires to study students' attitudes towards English reading was prepared. It included 15 items, both positive and negative statements, and was divided into three parts: opinions, feelings, and inclination to action. To assess their validity, all instruments were reviewed by three specialists. Reliability and item facility were determined in the pilot study. Cronbach's Alpha coefficient of the reading ability test and the questionnaires was 0.73 and 0.769 respectively. Since Cronbach's alpha was higher than 0.7, the test and the questionnaires were considered to reliably evaluate students' reading ability and attitudes towards English reading.

To collect the data, each of the two phases of the study was executed as follows. In the first week, students in the experimental and control groups were asked to complete a reading ability pretest. Soon after the pretest, the experimental and control groups received reading instruction, using a different method, for a period of eight weeks. Students in the

experimental group were taught using MLE. Students in the control group were taught using the traditional method. After receiving eight sessions, the students in both groups were asked to complete the reading ability posttest and the questionnaires on their attitudes towards English reading. To analyze the data, mean scores, standard deviations, two ways analysis of variance and a t-test analysis were applied.

## Results

To examine whether the results from the two universities were in the same way, two ways analysis of variance were used. The results were presented in Table 1.

**Table 1** Comparisons of reading ability among university groups

Source of Variance	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
<b>Pretest</b>				
Group (Control – Experimental)	1	.15	.05	82
University (UN – UB)	1	260.42	93.32	00
Group * University	1	1.35	.48	49
Error	56	2.79		
<b>Posttest</b>				
Group (Control – Experimental)	1	79.35	14.42	00
University (UN – UB)	1	205.35	37.32	00
Group * University	1	7.35	1.34	25
Error	56	5.50		

Table 1 reveals that the results were in the same way at both universities ( $F = .48, 1.34$ ). To compare the impact of the MLE to that of the traditional method on EFL students' reading ability, mean scores, standard deviations, and a t-test analysis were employed. The results were presented in Table 2.

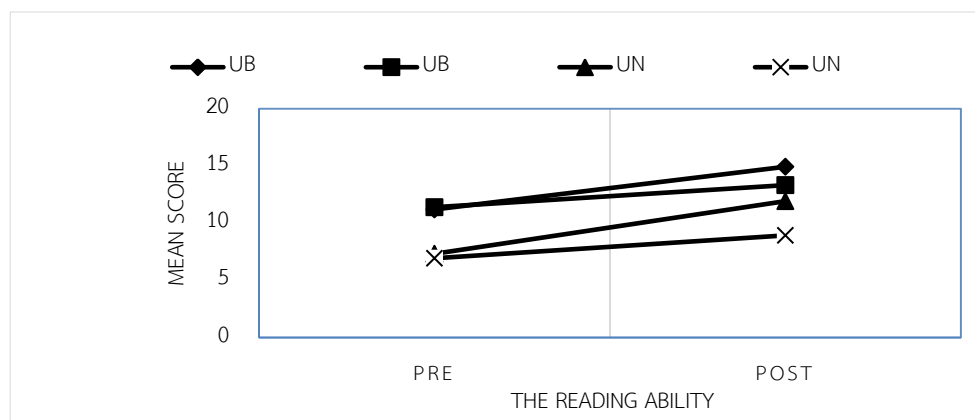


**Table 2** Comparisons of reading ability before and after the experiment

University	Group	Pretest		Posttest		Pretest and Posttest
		Mean	S.D.	Mean	S.D.	<i>t</i>
UB	Experimental	11.20	1.08	14.93	1.67	16.36***
	Control	11.40	1.50	13.33	1.11	6.44***
UN	Experimental	7.33	2.39	11.93	3.10	8.64***
	Control	6.93	1.44	8.93	2.89	3.24**

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 2 shows that after the experiment, mean posttest scores of both groups at both universities were significantly higher than the mean pretest scores, indicating that both teaching methods had a positive impact on EFL students' reading ability (UB:  $t = 16.36$ ,  $p < .001$ ;  $t = 6.44$ ,  $p < .001$ ; UN:  $t = 8.64$ ,  $p < .001$ ,  $t = 3.24$ ,  $p < .01$ ). The improvements of each group are also shown in Figure 1.

**Figure 1** The reading ability improvements of each group**Table 3** Comparisons of reading ability between the experimental and the control groups

University	Group	Pretest			Posttest			
		Mean	S.D.	<i>t</i>	Mean	S.D.	<i>t</i>	<i>d</i>
UB	Experimental	11.20	1.08	.42	14.93	1.67	3.09**	0.83
	Control	11.40	1.50		13.33	1.11		
UN	Experimental	7.33	2.39	.56	11.93	3.10	2.74*	1.02
	Control	6.93	1.44		8.93	2.89		

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

Table 3 shows that before the experiment, the mean scores of students in the experimental groups of both universities were not significantly different from those of the control groups (UB:  $t = .42$ ; UN:  $t = .56$ ). This suggests that students in the experimental and control groups had reading ability at the same level. However, the comparison of posttest mean scores of the experimental and control groups of both universities revealed statistically significant results (UB:  $t = 3.09$ ,  $p < .01$ ; UN:  $t = 2.74$ ,  $p < .05$ ). The effect size for this analysis (UB:  $d = 0.831$ ; UN:  $d = 1.02$ ) was found to exceed Cohen (1988) convention for a large effect ( $d = 0.8$ ), demonstrating high practical significance. This reveals a big difference between the mean scores of students in the experimental and control groups, implying that the reading ability of the students in the experimental groups of both UB ( $M = 14.93$ ,  $S.D. = 1.67$ ) and UN ( $M = 11.93$ ,  $S.D. = 3.10$ ) was significantly higher than that of the control groups at UB ( $M = 13.33$ ,  $S.D. = 1.11$ ) and UN ( $M = 8.93$ ,  $S.D. = 2.89$ ).

To compare the impact of the MLE to that of the traditional method on EFL students' attitudes towards English reading, mean scores, standard deviations, and a t-test analysis were employed. The results are presented in Table 4.

**Table 4** Comparisons of students' attitudes towards English reading

Source of Variance	University	Group	Mean	S.D.	t
Students' attitudes towards English reading	UB	Experimental	4.20	.47	.31
		Control	4.15	.41	
	UN	Experimental	4.28	.32	2.21*
		Control	4.05	.24	

\* $p < .05$

Table 4 demonstrates that attitudes towards English reading of the students at both universities were very positive (all  $M > 4$ ). At UB, although there was no significant difference in the mean attitude scores of students in the experimental and the control group ( $t = .31$ ,  $p > .05$ ), the mean score of students in the experimental group ( $M = 4.20$ ,  $S.D. = .47$ ) was higher than that of the control group ( $M = 4.15$ ,  $S.D. = .41$ ). On the other hand, at UN, the mean attitude score of the experimental group was significantly higher than that of the control group ( $t = 2.21$ ,  $p < .05$ ).

## Discussion and Conclusions

The results of this study showed that while both, MLE and the traditional method, improved EFL students' reading ability, MLE were more effective. Also, the results showed

that MLE had a large effect on the reading ability of students in the experimental groups at both universities. MLE provided students in the experimental groups at both universities the opportunity to use information that they found most effective for their learning styles, leading to knowledge acquisition. The results of this study are consistent with previous studies. For example, Sankey et al. (2010) studied the impact of multiple representations of content on learning outcomes, including learning performance and engagement. It was found that although multiple representations of content did not lead to discernable improvements in their learning, students perceived that it helped their comprehension and retention. Kesler (2011) observed that students' multimodal engagement with the text led to in-depth meaning-making and helped students realize multiple layers of literacy. Fadel (2008) found that on average students taught by multimodal designs outperformed students taught by traditional using single modes. Ganapathy (2014) found that students engaged in multimodal practices had productive learning outcomes and high motivation.

Additionally, this study revealed that students in MLE at both universities showed significantly higher improvements in reading ability than students who received traditional instruction, despite the fact that they had different baseline proficiency in English and were from different cultures and regions. This consistency of findings at both universities confirms that MLE facilitate both high- and low-achieving students' learning and support students with different backgrounds. This is because students perform better when their learning matches their learning styles and preferences. MLE focus on differentiation of learning experiences (Ganapathy, 2014: 420). Consistent with this explanation, Solvie & Kloek (2007) found that using multimodal presentation accommodated learners with various learning preferences and helped low-achieving students perform better. Yunus et al. (2013) found that using visual aids could facilitate learners who often found it difficult to comprehend texts. The results of the present study are consistent with several previous studies, implying that the implementation of multimodal learning environments enables instructors to cater to different EFL students' needs.

In addition, the results show that implementing MLE led to positive attitudes towards English reading. This teaching method helped EFL students participate more actively, so they perceived their classroom to be a better and more efficient place for learning, which contributed to their improved reading ability. According to Shah & Freedman (2003), MLE maintain students' attention by making the information more attractive and motivating. In Lizzio et al. (2002) study on university students from different faculties, positive perceptions

of the teaching environment predicted both academic achievement and qualitative learning. This is evident in the present study where students at both universities had to collaborate with their classmates to complete their tasks, leading to increased efficiency. Therefore, students perceived their reading class environments to be positive. More importantly, by using various modes in presenting information such as PowerPoint slides, audio, songs, and advertisements, students in the experimental groups had better attitudes towards their reading class. This study suggests that enjoyable classroom environments contribute to students' overall engagement in activities, which is consistent with previous studies. Falk-Ross (2014) explained that students with reading difficulties are more likely to be motivated to read with the use of multimodal texts as they are more easily comprehended with the aid of other supporting modes such as visuals and sounds. Moreover, Lee (2014) found that a series of multimodal English writing tasks could improve students' motivation and confidence after they had been discouraged by conventional language-learning instructions.

Notably, at UB, the attitudes of the experimental and the control groups did not differ significantly. This could be attributable to the students' higher proficiency and the fact that they were majoring in English. Students majoring in English may be more motivated and would have a more favorable attitudes towards learning English than students who do not major in English. The former may learn English for their professional pursuits and may have positive attitudes towards English reading, regardless of the teaching method. As a result, the teaching techniques did not significantly affect their attitudes. Although these results were not significant, students in the experimental group did hold more positive attitudes than those of the control group.

## **Suggestions**

### **Suggestions for application**

These findings may encourage more teachers and educators to consider the adoption of MLE for the purpose of designing courses and classroom activities.

### **Suggestions for further studies**

The researcher suggests the following ways in which future research might build upon and strengthen these findings. Qualitative research methods, such as an interview or observation, could be used to complement the picture gained through quantitative methodology. The present research study involved only students in tertiary level. It might be a good idea to investigate the impact of MLE on students at different grade levels or in

different subjects. Finally, game based learning is a powerful motivator tool to study and to deliver the learning materials (Sulphey, 2017: 6.2). Therefore, it might be interesting to explore the impact of multimodal games on EFL learners' performance.

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