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Integration of Game-Based Learning Approach as an Innovative Teaching Tool in Improving Students' Academic Performance in English

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Abstract:

The major objective of this research was to find out how incorporating game-based learning into the English classroom affected the students' grades. College freshmen from Okinawa Prefecture, Japan, participated in the research. Researcher used documentary analysis to collect data on students' English academic performance and the game-based learning (GBL) approach questionnaire developed by Pires et al. (2015) to evaluate the incorporation of GBL. Mean techniques, multiple correlation, and regression analysis were used to analyze the data. B coefficients of 0.561 (ludic characteristics), 1.198 (training learning component), and 0.629 (player profile) indicate that the three (3) variables of integration of the game-based learning approach impact students' academic performance in English to different degrees, according to the regression analysis results. Results show that students' English academic performance may increase by 0.561, 1.198, or 0.629 units for every unit improvement in integrating the game-based learning technique. After looking at the obtained beta coefficients more closely, we found that the 'training learning component' had the greatest impact on students' English academic performance (beta = 1.198) out of the three variables that made up the game-based learning method integration.

Keywords: game-based learning approach, students' academic performance, learning performance, ludic characteristics.

INTRODUCTION

Students and teachers alike may reap the benefits of incorporating gaming mechanics into English language instruction. By getting students more involved and excited about learning, game-based learning improves classroom teaching (Detweiler, 2022). Cooperation, communication, engagement, and group effort are all encouraged. Engaging in strategic games may enhance cognitive function. As a dynamic medium, gaming has the potential to inspire students to develop their skills and establish personal connections to what they are studying. A classroom environment that used collaborative game-based learning was created by Sung (2013). In order to help pupils stay organized and share knowledge while playing games, the environment used a grid-based Mindtool. Students' academic disposition, motivation, performance, and self-efficacy were positively affected by the research-informed decision to include Mindtools into a cooperative academic game. We found that this resulted from including a knowledge-organizing and -sharing element into the collaborative gaming environment. Nevertheless, Kuang-Chen et al. said that a plethora of research has shown that DGBL may enhance learning outcomes. Consequently, the research supplemented junior high history lessons with the Interactive Game-Based Learning System (IGLS) to boost students' interest in and performance in the subject. After eleven students participated in a four-week study, the experimental group benefited greatly from paired sample t-test analysis. five, and the number of days each week when the learning effect was strongest was shown by one-way ANCOVA. In addition, surveys showed that IGLS energised students' learning will and encouraged involvement from more than 90% of students.

The results of the suggested experiential learning using game-based instructional material were published in another research (Kalloo, 2013). A

smartphone app that mimicked the experience of working in a university library served as the course material. Students took many tests based on course information while engaging in experiential learning. To spice up the exams, we included more real-world examples, like finding an academic journal or booking a classroom. This research evaluated the efficacy of experiential learning using a comparison experiment. The instructional materials were used by the experimental group, whereas the control group used e-learning (non-experiential) materials, which were almost similar to experiential learning materials. In the comparison experiment, many assessment parameters were taken into account, such as pre- and post-test scores, delayed-test scores, and learning motivation ratings derived from the IMMS of the ARCS model. In terms of many of these measures, the experiment's findings showed that experience learning is better.

The research also examined data on the experimental group's behavior while learning and data on the learners' operations with the instructional materials. The research uncovered three distinct learning habits and showed that for optimal learning effectiveness, a teacher has to use a different instructional design for each. This work is unique since no one has previously published research on the integration of game-based learning techniques in teaching English, even though research has shown that these approaches generally have favorable effects on students' learning. Incorporating a game-based learning approach is relevant for Japanese college students because the Japanese educational system prioritizes values over academic competition. This approach can help Japanese students improve their English skills, which is crucial in this age of globalization and internationalization, and boost their motivation and self-efficacy. The primary goal of this research is to find out how well students do in English class when teachers use a game-based learning strategy as a new kind of instructional tool. The primary objective of this research is to determine the efficacy of ludic-based game-based learning as a novel pedagogical strategy.

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instructional design for each. This work is unique since no one has previously published research on the integration of game-based learning techniques in teaching English, even though research has shown that these approaches generally have favorable effects on students' learning. Incorporating a game-based learning approach is relevant for Japanese college students because the Japanese educational system prioritizes values over academic competition. This approach can help Japanese students improve their English skills, which is crucial in this age of globalization and internationalization, and boost their motivation and self-efficacy. The primary goal of this research is to find out how well students do in English class when teachers use a game-based learning strategy as a new kind of instructional tool. The primary objective of this research is to determine the efficacy of ludic-based game-based learning as a novel pedagogical strategy. features, training component, and player profile; to evaluate the current state of students' English academic performance; and finally, to ascertain the impact of incorporating the game-based learning strategy on students' English academic performance.

Literature Review

As shown by the publications of Chen (2017), Kalloo (2019), and Ak (2017), there has been a great deal of discourse and investigation on the consequences of students' heavy use of digital games. When used in the classroom, digital games may provide an environment that is conducive to learning that is dynamic, thorough, and extended. While lectures have their limitations as a teaching tool, including locally-based digital games into the curriculum may provide a more engaging and effective learning environment. The research set out to examine how using digital games as a teaching tool affected students' motivation and performance in the classroom. The study's findings were divided into three categories: (1) Learning motivation can be affected by using game-based learning; (2) Academic performance can be significantly affected by using game-based learning; (3) Learning outcomes and achievement are positively correlated when learning motivation is present; (4) Learning outcomes and academic achievement are significantly improved when learning motivation is present. According to Barata (2014) and Caton (2014), researchers are still testing out technology-enhanced learning approaches to find out what works and what doesn't, even though teachers are having a hard time getting students to engage in reading comprehension activities (2014). Augmented reality and game-based learning are two examples of technology-enhanced learning methodologies; both have shown efficacy in educational settings, but few research have documented their simultaneous usage. With the guidance of educators, the researchers in this study built an AR game using a design-based research approach. After that, they evaluated it both numerically and subjectively in a genuine classroom setting.

The reading comprehension outcomes achieved by the game are on par with those of more conventional methods; but, the game enhances the activity by encouraging problem-solving, exploration, and sociability behaviors; and children are more engaged and enthusiastic about the activity overall. Research on the effects of digital game-based learning on students' academic performance is lacking, and this research fills that need. Chang (2018), Ching-Huei (2018), and Chis (2018) all performed research that led to the identification of these gaps. In recent years, game-based learning has gained traction as a potential strategy to enhance energy education learning outcomes. According to studies done by Yang (2017), Chis (2018), and Fengfeng (2016), this phenomena may be explained by the fact that digital games can improve energy literacy and cause behavioral changes. It must be recognized, however, that not every student can succeed with this kind of assistance. The need for a study to investigate how students' responses to digital games are impacted by human elements in order to improve learning. This research intends to build on previous work by creating an educational game and studying how players' locus of control affects their behavioral intention and learning success in the energy knowledge domain using a game-based learning framework. Participating in the game improved energy knowledge more for participants with an internal locus of control (ILC) than for those with an external locus of control (ELC), according to the study's findings. Also, the suggested game may help students who learn best via hands-on experience as well as those who prefer more traditional classroom instruction. Barata and Hwang (2014) found that ELC learners' behavioral intentions, particularly their external behavioral intentions towards persuasion, legal action, and political action, were significantly improved after using the game. In order to better

understand where behavioral intention and energy knowledge are controlled within the setting of digital gaming, the present study's results are examined.

METHOD

The descriptive-correlational method, which aims to illustrate the independent and dependent variables, was utilized in the study. To determine if there is a connection between two variables, researchers often use a correlational study design. strength of the correlation between many variables. In particular, this research sought to ascertain if the use of game-based learning as a novel pedagogical mechanism had a notable impact on the academic achievement of pupils in the English language or not. Students from Okinawa Prefecture participated in the study during the academic year. 2020 and 2021. Participants in the research came mostly from the epartment of Science and Technology, with a focus on Accounting for the Bachelor of Science degree A Bachelor of Arts in Business Administration and Information System, completed between the ages of 19 and 22. The researcher used Slovin's technique to choose 399 college students to serve as the researchers selected 15,367 individuals as part of the study's sample.

Problem 1:

In what ways may the ludic traits, training component, and player profile of a game-based learning method be characterized as an innovative teaching tool? The ludic features, training component, and player profile were used to evaluate the integration of the game-based learning strategy. The average score of 3.24 in Table 1 indicates that there was a significant amount of integration of a game-based learning strategy in terms of ludic qualities. The following student actions and perspectives demonstrated this integration: The rules were changed throughout the game (3.12), they followed the rules to the letter (3.13), they wanted to win (3.28), they wanted to leave (3.12), they wanted to win (3.34), they had fun (3.33), they ignored their surroundings (3.39), they felt more immersed in the game than in real life (3.12), they were encouraged to learn from the game (3.13), they found something interesting in the game (3.28), they were hoping the game would end soon (3.12), they were feeling tense throughout the game (3.34), the game design piqued their interest (3.43), they enjoyed the game (3.39), and it made them feel anxious (3.12). In addition, they were compelled to keep playing (3.13), even though they first felt demotivated (3.28) due to the game's problems, and the game provides fresh challenges presented at a reasonable pace (3.12), overall length of the game (3.35), likelihood of playing again (3.40), initial boredom (3.19), gradual improvement in performance (3.34), clarity of the rules (3.33), complexity of the rules (3.39), difficulty of the content (3.12), speed with which they grasped the game's objectives (3.13), clarity of the content (3.28), difficulty of the questions (3.12), attention span (3.12) compared to other players, and difficulty in focusing on the text on the cards (3.12).

Table 1 Integration of game-based learning approach in terms of ludic characteristics

Indicators	Mean	Interpretation
1. The regulations were modified during the course of the game.	3.12	To a great extent
2. We strictly adhered to the game's rules.	3.13	To a great extent
3. I wanted to win the game.	3.28	To a great extent
4. I wanted to leave the game.	3.12	To a great extent
5. I wanted to leave the game as much as I wanted to win.	3.34	To a great extent
6. The game was enjoyable for me to play.	3.33	To a great extent
7. While playing, I tuned off everything around me.	3.39	To a great extent
8. I felt more immersed in the game than in real world.	3.12	To a great extent
9. The game inspired me to learn new things.	3.13	To a great extent
10. There was something intriguing about the game that drew my attention to it.	3.28	To a great extent
11. I hoped the game would be over soon.	3.12	To a great extent
12. I was tense after the game.	3.34	To a great extent
13. I was interested in the game's design.	3.43	To a great extent
14. I liked the game.	3.39	To a great extent
15. The game made me nervous.	3.12	To a great extent
16. The game encouraged me to continue playing.	3.13	To a great extent
17. I was immediately unmotivated by the game's difficulties.	3.28	To a great extent
18. The game introduces new challenges at a right pace.	3.12	To a great extent
19. I found the game to be too lengthy.	3.35	To a great extent
20. I would definitely play this game again.	3.40	To a great extent
21. I was bored from the start.	3.19	To a great extent
22. My performance increased during the game.	3.34	To a great extent
23. The guidelines are easy to understand.	3.33	To a great extent
24. The guidelines are more complicated than I would prefer.	3.39	To a great extent
25. The content of the playing cards is difficult to comprehend.	3.12	To a great extent
26. I understood the game's objectives without difficulty.	3.13	To a great extent
27. The information on the cards is clear.	3.28	To a great extent
28. The questions on the cards are tough to answer.	3.12	To a great extent
29. The theme of the cards caught my attention.	3.12	To a great extent
30. I found it difficult to focus on the text on the cards.	3.12	To a great extent
Average	3.24	To a great extent

According to the findings, college instructors are not using simple games in their lessons. The game's features allow kids to focus, have fun, and face challenges. Scholars like Chen (2017), Kalloo (2019), and Ak (2017) have devoted a great deal of time and energy to studying and discussing the impacts of digital games because of their widespread use as a way to engage students. Integrating digital games into educational techniques has expanded their significance beyond simple enjoyment to promote active and thorough learning among students.

With a mean percentage score of 3.26, it is clear that the game-based learning strategy was heavily used in the training component, as seen in Table 2. This was demonstrated by the following: the game's capacity to enhance students' learning (3.12), the content's lack of relevance to their interests (3.13), the improved understanding of the content (3.28) after playing the game, the students' active participation in group interactions (3.43), the game's indifference to their subject-specific learning (3.39), and the negative impact of the cards' difficulty on their learning (3.33). The game also had the following effects on the players: they reflected on their own struggles in life (3.39), were annoyed by certain aspects of the game (3.12), were motivated to study (3.13), were relaxed (3.28), did not feel any emotions (3.12), experienced a mix of relaxation and tension (3.12) while playing, thought they couldn't answer the questions (3.13), and felt fulfilled after completing the game. (3.28), gained incredible knowledge from the game (3.12), experienced frustration (3.34), kept track of helping other players (3.43), forgot to help other players (3.39), helped only one person (3.39), and made deals with certain players to stop others from winning (3.28).

Table 2 Integration of game-based learning approach in terms of training learning component

Indicators	Mean	Interpretation
31. The game assisted me in learning.	3.12	To a great extent
32. The content of the game is irrelevant to my interests.	3.13	To a great extent
33. I comprehend the content better now that I've played the game.	3.28	To a great extent
34. I interacted with other participants throughout the game.	3.12	To a great extent
35. I associated the game's content with other things.	3.34	To a great extent
36. The game limited my ability to participate in the group.	3.43	To a great extent
37. The game didn't help me learn anything about this subject.	3.39	To a great extent
38. The cards' difficulty hampered my learning.	3.33	To a great extent
39. Throughout the game, I pondered on the difficulties we face in life.	3.39	To a great extent
40. Some aspects of the game irritated me.	3.12	To a great extent
41. The game inspired me to study.	3.13	To a great extent
42. I was at ease during the game.	3.28	To a great extent
43. The game did not evoke any emotion in me.	3.12	To a great extent
44. During the game, I felt a mix of calm and tension.	3.12	To a great extent
45. I considered myself incapable because I did not know how to answer the questions.	3.13	To a great extent
46. The game's achievement gave me a sense of fulfillment.	3.28	To a great extent
47. I learned so much from the game.	3.12	To a great extent
48. During the game, I experienced frustration.	3.34	To a great extent
49. Throughout the game, I kept in mind to assist other players.	3.43	To a great extent
50. During the game, I only assisted one player.	3.39	To a great extent
51. I neglected to assist other players throughout the game.	3.39	To a great extent
52. I formed agreements with some of the other players to keep others from winning the game.	3.28	To a great extent
Average	3.26	To a great extent

Findings imply that the participation of the students was very evident in the conduct of game-based integration. Students were also taught to help other people through collaboration and camaraderie. In terms of training and learning, results state that they are trained to be more active in class while learning the value of teamwork in the midst of the game. The utilization of game-based learning in energy education has been progressively implemented as an effective learning instrument due to the potential of digital games to enhance energy literacy and stimulate modifications in behavior (Yang, 2017; Chis, 2018; Fengfeng, 2016). It is evident in Table 3 that the integration of the game-based learning approach in terms of the profile of the players got a 3.26 mean percentage score, which means that such integration was exercised to a great extent by the teachers. Specifically, students were able to have a habit of self-study by reading and summarizing (3.12), learn best through group discussion (3.13), realize that they learn better when they make associations to the practice (3.28), learn better when they express their creativity (3.12), believe that attending classes is indifferent to their learning (3.34), learn when they are interested in the subject (3.43), like board games (3.39), board games remind them of their childhood (3.28), they are impatient with games in general (3.12), and prefer video games than board games (3.40).

Table 3 Integration of the game-based learning approach in terms of profile of the players

Indicators	Mean	Interpretation
53. I have a habit of self-study, by reading and summarizing.	3.12	To a great extent
54. Group discussions are the most effective way for me to learn.	3.13	To a great extent
55. I've realized that making connections to the practices helps me learn better.	3.28	To a great extent
56. When I use my creativity, I learn more.	3.12	To a great extent
57. Attending classes has no effect on my learning.	3.34	To a great extent
58. I learn when I'm interested in the subject.	3.43	To a great extent
59. I like board games .	3.39	To a great extent
60. I think of my childhood when I play board games.	3.28	To a great extent
61. I'm impatient with games in general	3.12	To a great extent
62. I'd rather play a video game than a board game.	3.40	To a great extent
Average	3.26	To a great extent

If one were to observe the students of Okinawa Prefecture, they would seem to have a laid-back attitude. The participants demonstrate an awareness of the value of leisure interests and game-based learning for their academic success. Students can't succeed academically unless they participate in extracurricular activities and try new things in the classroom. One must pay close attention to the educational benefit of playing games in order to understand its relevance. According to Sung (2013), a grid-based Mindtool was used to build a collaborative game-based learning environment. Designed to facilitate student-to-student and group-to-group knowledge organization and sharing while playing a game. The research showed that students benefited from a collaborative educational game that used Mindtool technology. More specifically, the game increased learning success and self-confidence while simultaneously encouraging positive attitudes about learning. These advantages were said to have resulted from the collaborative gaming environment's incorporation of a function for organizing and sharing information.

Problem 2:

The students of Okinawa Prefecture give off the impression of being quite carefree. The students show that they understand the importance of hobbies and game-based learning to their academic performance. Without engaging in extracurricular activities and attempting new things in class, students will not be able to achieve academic success. If one wants to grasp the significance of gaming from an educational perspective, they need to focus on the benefits of gaming. Sung (2013) states that a collaborative game-based learning environment was created using a grid-based Mindtool. Made to help students work together in groups and exchange information while having fun. A collaborative educational game using Mindtool technology was shown to be beneficial for pupils, according to the study. To be more precise, the game promoted optimistic views about learning while boosting confidence and achievement in the classroom. The inclusion of a mechanism for organizing and sharing information in the collaborative gaming environment was stated to have caused these improvements.

Table 4 Academic performance in English

Academic performance in English		
Indicators	Frequency	Percentage
Outstanding (90 – 100)	161	40.5
Very Satisfactory (85 – 89)	172	43.0
Satisfactory (80 – 84)	53	13.3
Fairly Satisfactory (75 – 79)	13	3.3
Did not meet expectation (74 below)	0	0.0
Total	399	100.0

The results showed that the majority of the pupils achieved excellent or very good results. At the same time, it's acceptable and even satisfying that just 17% received the inferior performance. The pupils are doing really well, as a result. According to Hung et al. (2015), instructional games have recently arisen as a way for teachers to improve their own performance in the classroom. Instructional methods and learning modalities have been continuously evolving thanks to technology breakthroughs, as the authors further pointed out. Students' engagement, motivation, and desire to participate in learning activities are all positively impacted by the use of tablet PCs (TPCs) in the classroom. According to a pilot research, students' motivation, experience, self-efficacy for technology, self-efficacy for English, attitudes towards the TPC game, and happiness with the learning strategy were all improved by challenging games compared to matching games. Participants in the study's experimental group reported higher levels of happiness, learning performance, and flow experiences.

CONCLUSION

Thus, the following are the researcher's conclusions: first, that the game-based learning approach was implemented "to a great extent," which suggests that it can increase students' interest in learning; second, that 43% of respondents rated the students' English academic performance as "very satisfactory"; and third, that the three variables of the game-based learning approach's integration have a significant impact on students' English academic performance. The study's results and conclusions led the researcher to make the following recommendations: A game-based learning strategy may be implemented by instructors first. The first benefit is that it would make students' lives easier by reducing the monotony of online classes. The second is that it would give teachers a chance to let students show off their unique talents and abilities, which could help them improve their English language skills by revealing where they excel and where they need improvement. The third possibility is to provide webinars on game-based learning strategies in an effort to discover how students might use games to improve their English language skills. Collaborative skills among students, values-based leadership of college teachers, and game-based techniques as novel instruments for teaching English are all elements that might be investigated in the future.

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