Enhancing Communication Skills through Web-Based Gamification for High School Students

[1]S. Amutha Rani , [2]Dr. M. Vasimalairaja

[1]Research Scholar Centre for Distance and Online Education, (CDOE) Alagappa University Karaikudi- 630003

[2]Professor in Education Scholar Centre for Distance and Online Education, (CDOE) Alagappa University Karaikudi- 630003

***Corresponding Author**

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ABSTRACT

Scholars have linked improvement in English communication skills to advancements in science and future professional achievements. While web-based games have been shown to enhance educational outcomes, their effectiveness in teaching English to high school students has not been comprehensively studied. This study aimed to investigate the effectiveness of web-based learning methods in enhancing English communication skills among high school students. A total of 100 students participated and were randomly assigned to either the experimental or control groups. A mixed-method quantitative design was employed to analyze the data. The results indicated a significant difference between boys and girls in the experimental group. Overall, the study concluded that a blended learning approach, combining face-to-face instruction with web-based activities, can effectively enhance English communication skills at the high school level.

Keyword English, Communication Skills, Educational Technology, Interactive Learning Environments, Teaching/Learning Strategies.

INTRODUCTION

Acquiring English communication skills is essential in today's world (Crystal, 2003). English serves as the lingua franca in business, science, technology, and diplomacy (Graddol, 2006; Jenkins, 2007; Phillipson, 1992), and proficiency opens opportunities in multinational corporations, IT firms, tourism, and research, where drafting emails, presenting, negotiating, and collaborating with international teams are required (Hynes, 2021). Without these skills, career advancement and global competitiveness are limited.

Many education systems separate learning from assessment (Black & Wiliam, 1998). Web-based games offer an engaging way to integrate both (Gardner, 2011; Gee, 2007) and can serve as effective learning and assessment tools (Deterding, Dixon, Khaled, & Nacke, 2011). Digital gameplay also develops literacy suited to 21st-century learners (Reeves & Read, 2009; Ryan & Deci, 2000).

Web-based games can enhance learning and engagement (Prensky, 2001; Kapp, 2012), though much evidence comes from studies with weak methodologies (Hodges, Moore, Lockee, Trust, & Bond, 2020; Shute, 2011). Their effectiveness depends on alignment with learning objectives and learner characteristics (Sitzmann, 2011; Jenkins, 2006). Well-designed games can support the acquisition of English communication skills (Hamari, Koivisto, & Sarsa, 2014).

Significance of the Study

Effective communication is a critical skill for academic success, future careers, and responsible citizenship.

Many high school students struggle with these skills, leading to difficulties in classroom participation, group projects, presentations, and expressing ideas clearly (Huang & Soman, 2013). Beyond academics, communication is essential for social interactions, conflict resolution, relationship building, and community engagement. As digital natives, high school students are often proficient with web-based technologies (Landers, Auer, Collmus, & Armstrong, 2018).

Web-based platforms offer flexible opportunities for students to practice and improve their communication skills outside the classroom (Sahin & Yurdakul, 2020). This study adds to research on gamification in education (Aulia Fatah, 2025) and provides evidence for educators and policymakers on its potential to enhance curriculum design and teaching strategies (Marcos-Pablos & Martínez, 2024). Gamified, collaborative activities can boost students' self-confidence, verbal and written expression, and teamwork skills (Bayatpour, Maghami, & Hassani, 2022).

Objectives of the Study

To evaluate the effectiveness of web-based games in improving high school students' English communication skills.

- First, the research aims to evaluate the effectiveness of web-based games in enhancing high school students' English communication skills, including clarity of expression, participation in discussions, and performance of written and oral tasks.
- Second, it aims to compare the post-test performance of students using Web-Based Gamification (WBG) with those following the Traditional Learning Instruction (TLI) to determine whether WBG yields significantly better outcomes.
- Finally, the study aims to examine whether students' gender and locality (urban or rural) lead to significant differences in English communication skills when using Web-Based Gamification (WBG).

Hypothesis

Based on the above research questions, the following null hypotheses were formulated for the study:

1. There was no significant difference in the post-test performance of students learning communication skills in English through the WBG and those learning with TLI.
2. There was no significant difference between genders regarding post-test scores in learning communication skills in English after experimental treatments.
3. There was no significant difference between localities regarding post-test scores in learning communication skills in English after experimental treatments.

METHODOLOGY OF THE STUDY

To address the research question, a pre-test quasi-experimental design was employed. The study involved 100 high school students (48 boys and 52 girls) from St. Ignatius Matriculation Higher Secondary School, Vellakulam, in Pudukottai District, Southern Tamil Nadu. Participants were selected purposefully to ensure a homogeneous sample, as their recent academic performance was consistent. Once recruited, students were randomly assigned to two groups of 50. The control group (24 boys and 26 girls) received traditional lecture-based instruction, while the experimental group (24 boys and 26 girls) was taught through web-based gamified instruction.

Study Tools and Procedure for Implementation

The study used the Communication Skills in English Questionnaire (CSQ), a 20-item multiple-choice test, to collect data. The questionnaire has a reliability coefficient of 0.88. A pre-test was first administered to both the control and experimental groups. Over a period of four weeks, the groups received different instructional methods:

- The experimental group engaged with Web-Based Gamification (WBG).

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- The control group received traditional lecture-based instruction (TLI).

Study Variables

Independent Variables (IVs):

1. Web-based gamification (WBG)
2. Traditional learning Instruction (TLI)

Dependent Variable (DV):

1. Communication skills in English (CSE)

Statistical Treatments

The study employed SPSS (Statistical Package for the Social Sciences) for data analysis, setting a 0.99 confidence interval for all tests. As the data were normally distributed, parametric statistical methods were applied.

Descriptive statistics were calculated to provide an overview of the data, including:

- Mean
- Standard deviation

Inferential statistics were then used to evaluate the effectiveness of the intervention. Specifically, an independent-samples t-test was conducted to measure the effect of web-based gamification (WBG) on student performance and knowledge retention. In addition, a paired-samples t-test was employed to compare results both within groups and between the independent variables.

Analysis and Interpretation

To establish the homogeneity of the control and experimental groups, a t-test was employed to evaluate the statistical significance of any differences observed in their mean pre-test scores. The findings are summarized in Table 1.

Table 1: Significance of the difference between pre-test mean value scores of the control and experimental group.

Group	N	Mean	SD	Calculated ‘t’value	Remarks at 5% Level
Control	50	34.80	3.764	4.605	S
Experiment	50	40.20	2.541		

(At 5% level of significance, the table value of 't' is 1.96.

Table 1 indicates that the control (TLI) and experimental (WBG) groups were homogeneous at the start of the study. The control group had a pre-test mean score of 34.80 (SD = 3.764), while the experimental group had a slightly higher pre-test mean of 40.20 (SD = 2.541).

H1: There was no significant difference in the post-test performance of students learning communication skills in English through the WBG and those learned with TLI. Table 2 describes the analysis used to test this hypothesis.

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Table 2: Significance of the difference in the post-test performance between control and experimental groups.

Group	N	Mean	SD	Calculated 't'value	Remarks at 5% Level
Control	50	36.67	9.308	1.340	NS
Experiment	50	30.33	23.084		

(At 5% level of significance, the table value of 't' is 1.96.)

Table 2 shows that the control group (TLI) scored higher (M = 36.67, SD = 9.308) than the experimental group (WBG) (M = 30.33, SD = 23.084). However, the t-test value (1.340) was not significant at the 0.01 level, so the null hypothesis could not be rejected. Thus, WBG did not prove more effective than TLI in improving English communication skills.

H2: There was no significant difference between genders regarding post-test scores in learning communication skills in English after experimental treatments. Table 3 describes the analyses used to test this hypothesis.

Table 3: Results of the t-test on learning communication skills in English between boys' and girls' students with post-test scores in the experimental group.

Group	N	Mean	SD	Calculated 't' value	Remarks at 5% Level
Boys	24	32.47	2.875	3.040	S
Girls	26	36.13	3.681		

(At 5% level of significance, the table value of 't' is 1.96.)

Table 3 indicates that in the post-test of the experimental group, the boys scored 32.47 (SD = 2.875), and the girls scored 36.13 (SD = 3.681). A total of 100 students participated in the study and were randomly assigned to either the experimental or control group. Hence, the null hypothesis is rejected. This suggests that, due to broader access to new technology, both male and female students use current technical methods in similar ways.

H3: There is no significant difference between localities regarding post-test scores in learning communication skills in English after experimental treatments. Table 4 describes the analyses for testing this hypothesis.

Table 4: Results of t-test on learning communication skills in English between rural and urban students with post-test scores in the experimental group.

Group	N	Mean	SD	Calculated 't' value	Remarks at 5% Level
Rural	24	33.93	2.865	2.584	S
Urban	26	36.87	3.335		

(At 5% level of significance, the table value of 't'is 1.96.)

Table 4 shows that in the post-test of the experimental group, rural students had an average score of 33.93 (SD = 2.865), while urban students scored 36.87 (SD = 3.335). The calculated T-value of 2.584 was not statistically significant at the 0.01 level, leading to the failure to reject the null hypothesis. This suggests that both rural and urban students utilize modern technological methods similarly, possibly due to the widespread availability and access to new technological devices resulting from rapid technological progress.

Suggestions of the Study

In conclusion, integrating web-based games alongside traditional instruction positively enhances students'

English communication skills. While female students scored slightly higher than males, the difference was not significant, showing that gender does not influence effectiveness. Similarly, rural students outperformed urban peers without statistical significance, suggesting a consistent impact across locations. However, significant differences emerged between average, below-average, and above-average students, indicating that effectiveness may vary with academic performance. Further research is needed to explore the factors behind these differences.

CONCLUSION OF THE STUDY

This study aimed to guide future curricula by aligning with technological advancements in education, where digital tools like e-learning, mobile learning, and gamification are increasingly used. It specifically examined the impact of web-based games on high school students' English communication skills. Findings revealed that students using web-based games outperformed those taught traditionally, with no significant gender differences. These results support the integration of web-based games into classrooms as effective tools for enhancing communication skills.

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