

Empowering English Learners: Using AI Enhanced Gamification and Zoom to Enhance Student Success

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ABSTRACT:

The educational environment has changed drastically in the twenty first century and notions of teaching and learning have acquired a different meaning. Mobile technologies and mobile learners have altered the manner in which people learn languages especially English as a second language (ESL). To the generation of digital natives, smartphones enable one to study wherever they are. In this respect, educators are avid about integration of new technologies in their classes. Mobile devices in the classroom have been utilized by both teachers and students to make the learning process resemble a great experience. The present research paper examines the perception of students regarding the use of smartphones to learn and develop their English. Based on a sample of 30 students, who attend a rural secondary school, the study presents the way interactive learning technologies can support the different levels of proficiency and promote a learning environment that is interesting and challenging. The mixed technique approach (role playing, brainstorming, a variety of methodologies, and discussions) was used to collect the data on this descriptive study. They were found to improve the purity, clear, accuracy, logic, expressiveness and conciseness of language besides its accuracy. Also, they facilitate the acquisition of skills to operate the linguistic instruments, create and present opinions, interpret information, and organize reports. Reading and listening assist a person to be more learned, to develop more skills in expressing oneself accordingly to the subject matter of the issue at hand, among others. The next area of research may be to discover and develop new and vibrant teaching methods that will assist the students to enhance their language abilities.

Keywords: AI-enhanced learning, online education, English language learning, Gamification.

1. INTRODUCTION

This aspect has transformed the way education is conducted in modern day learning contexts as the interactive learning technologies have become the new staple in ESL classrooms [1]. The interactive learning technologies are a wide range of tools and platforms that assist in making the process of language acquisition interactive so that the learners can actively participate in the

process [2]. Multimedia-rich materials through gamified apps and virtual worlds and immersive experiences can be found in the technologies, which are dynamic and interactive, and can be customized to the varying needs of learners [3]. Interactive technologies have transformed the conventional teaching processes, as they offer new ways of improving student engagement, motivation, and language learning outcomes due to the opportunities they offer to participate actively

and provide immediate feedback and personal learning experiences [4].

The importance of interactive learning technologies in English language teaching is the fact that they help them tackle the challenges which are complex and challenging to educators and learners in the process of language acquisition [5]. In a world where there is a high rate of globalization and English lingua franca has become the norm, academic, professional, and social success depends on speaking English. Nevertheless, conventional pedagogical methods are frequently incapable of successfully catering to the learners and allowing them to gain significant language acquisition experiences [6]. It is against this background that this research study seeks to discuss the theoretical basis and practical implementation of interactive learning technologies in ESL teaching. Through the analysis of the theory-practice intersection, the study aims at generating knowledge on the successful incorporation of interactive learning technologies in English language teaching pedagogy, which would eventually lead to the development of innovative and student-centered practices in the pedagogy of language learning [7].

The use of social media platforms such as WhatsApp, Zoom have been suggested in some of the works. Nevertheless, the discussion of how the networked learning and collaborative technologies can be used to empower student autonomy, engagement, and practice of the language in the real world has not accomplished much. There is little strong evidence of data connecting interactive engagement with quantifiable learning outcomes, especially in rural secondary schools. Though existing systems have gamification and VR/AR tools, little literature has been done to address the systematic application of these tools and their quantifiable effects in ESL classes [8]. The use of AI can increase the level of interactivity, personalization, feedback, and analytics in ESL. The integration of AI and gamification with Web-2.0 tools and interactive video lessons will enhance adaptivity and formative assessment automation and yield fine-grained data on learner behavior,

which is especially useful in rural settings with scarce teacher resources.

This quantitative research aims to investigate the impact of integrating computer-assisted learning applications, the Internet, e-books, Virtual Reality (VR), Facebook, mobile learning, WhatsApp applications, Duolingo, and others in the English learning process for students aged 12 to 17 years old, both male and female [9]. It is hoped that this research can contribute to the development of language learning applications and software that integrate gamification elements. To collect data, researchers used a questionnaire designed to measure participants' perceptions and attitudes towards the use of online learning applications in learning English. This questionnaire consists of a series of questions or statements that aim to obtain information about the student's self, knowledge, beliefs, etc. In this study, a questionnaire was also used to assess the influence of Facebook on students' English writing skills and motivation.

Gamification has risen to popularity in the area of teaching and learning a foreign language. Stocker (2020) [10] established that the incorporation of gamification aspects in language classrooms increased the autonomy of students, their competence, and emotional and behavioral engagement. On the same note, in [11] the authors have indicated that students reported positive attitudes towards learning in gamified learning environments, which contributed to the elimination of boredom and created a more entertaining classroom ambience. The tendency to use gamification in learning is an indication of the learning shift to the new generation. Contrary to the past it is known that Generation Z (Gen Z) learners, so-called digital natives, have been surrounded by technology and social media ever since their childhood. As given in [12], teachers start seeing the opportunities of using game-based methods to involve and inspire this generation that is full of technologies.

Conventional pedagogic approaches might fail to meet the needs of various learning styles of contemporary students. Incorporation of modern technology in education according to Szymkowiak

et al. (2021) [13] is mandatory in the 21st century especially with the short attention span of generation Z learners. Such students can always access information of various sources all over the world and hence need constant stimulation by the diverse and dynamic content. Likewise, Sartor (2020) [14] remarks that the Gen Z students are the regular and constant technology users who would want to see the implementation of digital applications in their learning process. Gamification is therefore a good fit to their preferences in learning as it provides engagement, immediate feedback and competition-based motivation and achievement. Using Web 2.0 tools, teachers can design interactive and game-based learning environments that encourage participation, cooperation and fun.

Other interventions have been done in the past mostly focusing on one particular skill (listening or speaking) as opposed to the comprehensive approach of listening, speaking, reading, and writing [15], [16]. Despite the fact that many studies have analyzed the advantages of gamification and digital learning tools to teach English language, there are still critical gaps in the implementation of artificial intelligence (AI) to improve adaptivity, feedback, and personalization. The currently available gamified models, are mainly based on motivational features with no smart systems capable of analyzing the performance of the learners in real-time and modulate the content accordingly. Moreover, the majority of previous studies focus on urban or well-endowed educational settings, meaning that the rural or disadvantaged learners will lack service of technology-based English teaching. There is a dearth of empirical research on the possibility of enhancing gamification using AI to change the engagement of learners, their language competence, and their motivation at the same time. Moreover, not many studies have systematically tested the synergies of gamification, adaptive AI feedback, and interactive multimedia and how they would work together to enhance several language skills, such as listening, speaking, reading, and writing, in one coherent instructional design. The rationale of this research is rooted in the urgent

necessity to design individualized, interactive, and inclusive ESL learning spaces that mirror cognitive and technological requirements of the Generation Z learners. The conventional teaching method is not always able to hold the attention of the learner or offer real-time personalized feedback. This study will use AI-assisted gamification to fill the gap between engagement and quantifiable learning outcomes. AI is capable of delivering real-time pronunciation feedback, typing suggestions and adaptive task suggestions-offering some form of interactivity and customization that can never be realized with the static systems. Moreover, this research is aimed at giving the rural students, who in most cases are not exposed to the more sophisticated teaching technologies, a practical and smart educational platform, which will enable them to learn independently as well as under the guidance of their teachers. Finally, it is driven by the desire to show that the combination of AI with gamified pedagogy may turn the ESL learning into an interactive, data-informed, learner-centered experience.

Although the potential of gamification and interactive learning tools has proven to be effective in increasing student engagement, in most cases, the lack of adaptive feedback and personalized learning pathways hinders the effectiveness of these tools. The existing ESL instructional practices especially in the rural schools do not help in accommodating the individual learner differences in proficiency, drive and cognitive profile. Conventional systems offer homogenous teaching without examining student performance data to customize instruction. This disconnect highlights the necessity of an AI based gamified ESL system, which can dynamically change the intensity of the content, offer real-time feedback through speech and text analysis, and monitor the engagement patterns of the learners. The main issue that is examined in this research is the absence of a creative, adaptive, and inclusive system that would successfully combine AI with gamification to support language learning, the desire to learn, and student engagement among ESL learners.

This paper had an AI-based gamification learning system and zoom platform to learn English as a Second Language (ESL) among university students. The system was integrated with interactive video lessons, game-based tasks, and adaptive feedback and learner analytics modules, which are assisted by artificial intelligence modules. Using communicative tools and collaborative capabilities of Zoom [17], a teacher can design interactive and engaging language learning experiences that can support the needs of the students in the digital era. The research project is added to the existing debate on the use of technology in language education, focusing more on the necessity to include new online resources such as Zoom to address the changing demands of students [18]. The learning management system also included the elements of AI which included the speech recognition to determine the pronunciation and natural language processing which provide automated writing feedback, and make the learning experience personal. The framework was implemented and experimented through six weeks of testing that included quantitative measurements and qualitative observations to determine the effect of the framework on student engagement, motivation, and language proficiency. This paper will fill these gaps by integrating interactive videos, gamified work sheets, VR/AR and mobile learning applications to enhance comprehensive language proficiency and offer empirical evidence in a rural setting. This work is novel due to the combination of gamification and artificial intelligence to form an adapting and data-driven ESL learning environment that can serve digital-native learners. In contrast to the traditional gamified methodology, based on the inactive gameplay, which only registered gameplay rules, the suggested framework incorporates the AI-driven speech recognition to evaluate the pronunciation, the natural language processing, providing automated feedback on writing, and the adaptive recommendation algorithms generating the individual learning paths based on the performance and interest of the learner. This combination design improves motivation and interactivity as well as provides real-time analytics of the learners

which can be used by educators to make informed pedagogical choices. Moreover, the subject of the study, the rural and remote learners, provides a peculiar twist because it considers the issue of accessibility and inclusivity, which has not been thoroughly discussed in previous studies on technology-enhanced language learning.

2. METHODOLOGY

The main goal of the given research is to design, develop, and test the AI-based gamified learning system with the Zoom platform-based learning to teach English as a Second Language (ESL), which will help students to improve their engagement, motivation, and competence in the four basic skills listening, speaking, reading, and writing. The following are the specific objectives: To create an interactive ESL learning environment incorporating the gamification features (points, levels, leaderboards, badges) with AI based modules to provide real time feedback and adaptive learning. To measure the success of the proposed system in enhancing the student engagement, motivation, and performance relative to the traditional or non-adaptive gamified learning environments. In order to explain the data on the conduct and performance of the learners with the help of the AI analytics to discover individualized learning paths and offer adaptive content suggestions. To determine how the model is relevant to rural and resource-constrained learning environments to make them accessible, inclusive, and scalable. The study is based on rural ESL students, especially in rural or semi-urban areas that are not well exposed to modern digital learning instruments. It is within the context of study the design, development, and assessment of AI-enhanced gamified modules presented in a Learning Management System (LMS) during a particular instruction period. It focuses on the quantitative results (test results, engagement metrics) but also on the qualitative ones (learner and teacher feedback). Although this framework is created regarding English language learning, the methodology can be applied to the other areas of subjects that require individualized, interactive, and adaptive teaching.

2.1. Research design

The research design adopted in this study is a mixed-method quasi-experimental study that uses both a quantitative and a qualitative approach in determining the effectiveness of technology-based English language learning. Particularly, it examines how Zoom can be used to improve the English proficiency of students and how to incorporate gamification, interactive video, and AI-based adaptive learning tools into English as a Second Language (ESL) teaching with the fifth-grade learners. The data on the perceptions and practices of the students in terms of using Zoom to learn a language are collected through a survey method. The quantitative element is the effect AI-enhanced gamified education has on academic performance and engagement in students, and the qualitative element is the experiences, perceptions, and attitudes of learners and teachers to AI-supported gamification in online learning settings.

The following are the main components of the study framework: The instructional modalities were compared in three groups:

- Control Group - conventional online teaching under the guidance of a teacher.
- Non-AI Gamified Group - video lessons with Web 2.0 tools of gamification (Kahoot, Quizizz, Google Forms).
- AI-Enhanced Group - this group is the same as the gamified group, but with the addition of AI features, which include adaptive learning engine, automatic speech recognition to provide pronunciation feedback, automated writing evaluation, and chatbot tutor. This design allowed the between-group and within-group analysis as a means of identifying the incremental effect of AI on learning outcomes and engagement.

2.2. Participants

Participants and Sampling phase constitute a very important aspect of this research as the findings will be valid, reliable and reflect the target population. The respondents in this research are university students who will be taking online English language courses at the standard academic

semester, and who mostly belong to Gen Z students that show a high inclination towards digital tools and technology-based learning. A purposive and stratified random sampling method was used to ensure that a variety of learning capabilities, technological awareness and socio-economic backgrounds are represented. The initial stratification of the selected region schools/institutions was conducted on the basis of the factors like the availability of infrastructure, previous exposure to digital tools, and the number of students. In both strata, students were randomly allocated to experimental and control groups so that there were equal proportions of males and females, high- and low-achievers, and those who had access to technology. The experimental group used AI-enhanced gamified learning content along with interactive video lessons on Zoom, whereas the control group used standard/teacher-led online ESL training. Approximately 90 students were the sample size and it was split into three groups (30 each). To pilot test, a smaller group of 30-50 learners were adopted, with the full-scale intervention that was aimed at 60-100 participants to be statistically powerful and manageable to conduct in-depth qualitative analysis. Informed consent was granted by all the participants and their guardians and the study was approved by the institutional review board. They were made to feel their anonymity and confidentiality and they were also assured their right to withdraw at any time. This effective sampling method was to be employed to determine significant differences in student experiences and have powerful empirical findings on the efficiency of the Zoom-based, interactive, and AI-driven ESL instruction methods.

2.3. Materials and tools

The study is an integration of two major components of instructions, i.e. the Zoom platform (synchronous learning), and an AI-enhanced gamified platform (asynchronous, adaptive interaction). A combination of all these systems creates a blended learning ecosystem which is targeted to improve English as a Second Language (ESL) proficiency by using a

combination of real time interaction, self-paced learning and intelligent feedback systems.

Zoom Platform is used as the major synchronous space, where the English language is taught in real time, pronunciation exercises, discussions with peers, and collaborative tasks are implemented. It allows students to communicate with instructors and peers directly, which creates a real-life communication and use of contextual languages. Pair and group activities are supported with the help of zoom breakout rooms and screen-sharing tools, whereas chat functions help to practice vocabulary and interact written communications.

As a supplement to the Zoom, an AI-based gamified learning platform was created based on the use of intelligent algorithms, like Natural Language Processing (NLP) and Reinforcement Learning. To increase motivation and maintain the engagement of learners, this platform includes points, badges, leaderboards, and sequencing of tasks based on their adaptive nature. English classes were divided into interactive video lessons, and they included multimedia features such as visuals, speech, and in-built understanding tests to ensure that the knowledge was remembered and the lesson was not lost.

Online learning platforms such as Kahoot, Quizizz and Google forms were incorporated to deliver interactive quizzes, competitive assignments, and progress. Leaderboard systems promoted healthy competition, and achievement badges and rewards were used to promote the feeling of accomplishment

Adaptive and personalized learning experiences were facilitated by several parts of the AI modules like Adaptive Learning Engine, Automatic Speech Recognition (ASR) tools, Automated Writing Assessment model, Chatbot Tutor.

The learning intervention combined interactive video-based lessons, gamified learning tasks, and AI-adaptive feedback systems into a single ESL system. The design was based on blended learning in which students could change to Zoom live sessions (collaborative learning) and self-paced modules (AI-directed), which enabled

students to fluently transition between collaborative and self-paced learning.

Learning units based on a scenario and aimed at developing the four main language skills: the ability to listen, speak, read, and write, using context-based activities. In-game challenges, tokens, and advancement to enhance engagement and intrinsic motivation. A machine learning algorithm monitored and changed the difficulty levels regularly based on the performance of the learners, offering specific recommendations and feedback. The research structure of the study is based on various pedagogical theories to provide the soundness of the instruction and the involvement of learners. The theories and practices that are supportive of active learner engagement and collaborative knowledge construction are task-based interaction and discussion-based learning. Multimedia Learning Theory influences the amalgamation of visual, auditory and textual data in an attempt to amplify understanding and memory. Gamification Theory offers an incentive based on challenges, objectives and rewarding systems, which are in line with both intrinsic and extrinsic motivation of learners. Such an integrated approach makes sure that the students achieve linguistic competence, as well as digital literacy, team learning experience, and self-managed learning behavior that can be applied to the contemporary, technology-mediated learning settings. Along with the digital platform modules, students have utilized other traditional tools like worksheets, quizzes, flashcards and group works. These modules support the modules from videos and AI methods.

2.4. Instrumentation

The data for this study was collected through a structured questionnaire designed to gather information on various aspects related to language learning using Zoom [24]. The questionnaire had three key sections which addressed different areas of the demographics, usage patterns and perception of the participants in regards to the effectiveness of Zoom. A systematic questionnaire will be developed in order to extract information out of the participants.

2.4.1. Demographic Information

The demographic information that will be collected in this section will include: age, gender, academic major, [25] and proficiency level in English.

Table 1 presents the demographic variables included in Section A of the questionnaire, providing details on participants' age, gender, academic major, proficiency level in English, and year of study.

Table 1 Demographic Information

Demographic Variable	Number of Participants
Gender	Male: 163
	Female: 137
	Total: 300
Age	18-20 years: 120
	21-25 years: 150
	26-30 years: 20
Academic Major	Engineering: 100
	Literature: 80
	Science: 50
Proficiency Level in English	Beginner: 50
	Intermediate: 150
	Advanced: 100
Year of Study	Ist Year: 80
	IIInd Year: 70
	IIIrd Year: 90
	IVth Year: 60

2.4.2. Usage of Zoom for Language Learning

In this section, the frequency of use, the purpose of use and the level of satisfaction with Zoom will be evaluated among the students. and AI applied gamified language learning platform [26]. The discussion provides a comparative perspective into the interaction between synchronous (Zoom) and asynchronous (AI-based) tools as the means of increasing the level of proficiency in the English language learning in learners.

The participants were provided with questions about their average duration of being on each of the platforms, their major use functions (e.g. communication, collaboration, practicing pronunciation, or self-paced exercise), and how well they were satisfied with their experience. The AI-integrated platform variables added to the previously proposed one were period spent on adaptive learning activity, exposure to gamified modules, and the level of perceived engagement and motivation.

Table 2 outlines the variables pertaining to participants' usage of Zoom, including the frequency and duration of usage, purposes for usage, and satisfaction levels with the platform. Details of Gamification learning tool is shown in Table 3.

Table 2 Usage of Zoom

Usage of Zoom	Details
Used Zoom for Communication	300 (Number of Participants)
Part of Zoom Group	234
Not Part of Zoom Group	66
Frequency of Usage	High
Duration of Usage	More than 3 hours/day
Purposes of Usage	Language learning, Collaboration, Presentations
Satisfaction Levels	Very Satisfied

Table 3 Details of Gamification learning tool

Usage of Gamification platform	Details
Adaptive task interaction	Average: 2-3 modules/day
Time spent on app activities	2 – 2.5 hours/day
Game tools used	Kahoot, Google forms, Quiziz
Used AI features	Pronunciation feedback, writing assessment, chatbot tutor
Engagement level	High
Satisfaction Levels	Very Satisfied

These values reflect positive engagement and satisfaction levels among the participants regarding their usage of Zoom for communication and collaboration purposes. This comparative study proves that students were actively working with both platforms. Although Zoom has been highly rated as a tool of real time communication

and collaborative processes, the AI-based gamified solution has been valued due to individualistic learning and reactive feedback processes. The combination of the two tools guaranteed a balanced nature that facilitated linguistic proficiency, confidence, and long-time motivation in the learners.

2.4.3. Perception of Zoom's Effectiveness

In this section, the perception of students regarding the effectiveness of integrated AI-gamification and Zoom will be investigated. in enhancing different English language competencies, such as speaking, listening, reading, and writing skills [27].

Table 4 shows the variables of perception concerning the perception of the participants towards AI-gamification and Zoom efficiency in enhancing different language skills, including speaking, listening, reading, and writing. Improving the data by presenting the data in the form of student response in Likert scale categories like strongly. Agree (SA), Agree (A), Neutral (N), Disagree (D), and strongly disagree (SD).

Table 4 Perception of AI-gamification and Zoom's Effectiveness

Statements	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean Score
Integrated AI-gamification and Zoom help me get better at communicating in English.	6	13	20	39	22	3.88
AI writing feedback helps me get better at writing in English.	9	14	13.4	53	10.6	3.82
Interactive module helps me get better at reading in English.	6	15	15	34	30	3.85
Gamification module gives me more courage to write in English.	11	13.3	15.7	38	22	3.78
Zoom gives me more self-assurance when speaking in English	7	15	13	44	21	3.65
Realtime speaking sessions on Zoom gives me more courage to speak English	5	15	20	35	25	3.75

Zoom encourages me to use English for communication;	2	19	15	32	32	3.75
Chatbot encourages me to practice English daily	3.6	14.4	21	36	25	3.64
AI-gamification and Zoom inspire me to compose in English.	4	19	15	34	28	3.62
AI-gamification and Zoom add fun to learning	10.7	10.3	15	29	35	3.55
Zoom based collaborative platform offers an English learning foundation.	9	16	10	36	29	3.68
Zoom aids with my vocabulary acquisition	10	12	17	28	33	3.81
Gamification has helped me adopt a more upbeat perspective on learning English as a second language.	3	10	23	42	22	3.65
AI method feedback facilitates learning	3	13	22	37	25	3.69
The integrated tool helps to learn outside class hours	6	16	18	38	22	3.52

The table clearly breaks down the perception of the participants as far as the effectiveness of Zoom in is concerned. improving different language abilities and attitudes. The questionnaire used in this study was structured. written regarding an in-depth analysis of literature and theoretical guidelines in the field. technology-enhanced learning and field of language education. The items of the questionnaires were designed cautiously to address different features that can be associated with learning languages through gamification and Zoom, the demographics, usage behavior of the participants, and the attitudes towards gamification and use of Zoom in enhancing language skills.

The questionnaire was tested on language education to guarantee the content validity of the questionnaire. tested by specialists and registered with a few students. The pilot test was supposed to determine the clarity, understandability, and

validity of the questionnaire items. Depending on the responses, minor. they were revised to make the questionnaire more appropriate and clearer to the research goals.

3. Work implementation

The implementation process was developed to incorporate Zoom-based teaching, gamified learning, and AI-generated adaptive support to enhance the level of student proficiency in English language learning within an online environment in a systematic manner. The whole research was eight weeks-long and organized into three major activities, which were Orientation, Instructional and Evaluation, backed by the preparation of the implementation steps to permit the smooth completion and control.

Phase 1: Orientation Phase (Weeks 1-2)

This preparation phase included the introduction of participants and teachers to Zoom and game-based tools as well as AI-based modules.

The students were taken through live sessions on the use of Zoom in synchronous learning, interactive discussions, and collaboration, the gamified learning interface and AI feedback tools.

A baseline test in the form of a standardized English proficiency pre-test was conducted to evaluate the pre-test reading, writing, listening, and speaking skills. First engagement and accuracy of response were also recorded on the AI analytics dashboard. Educators were taught to implement gamified features (Kahoot, Quizizz, Google Forms) and analyze AI-generated feedback to help inform individualized instruction.

The Learning Management System (Google Classroom or custom LMS) was set up so that it could combine video lessons, gamified activities, and AI-based feedback attributes: pronunciation check, automated writing analysis, and learning analytics.

Phase 2: Instructional Phase (Weeks 3-7)

This was the gist of the intervention phase because the learners participated in guided lessons that were a combination of live Zoom meetings and interactive AI-gamified lessons. There were three modes of instruction.

Control Group - Attended regular online classes with the teacher through Zoom in the lecture and discussion format.

Gamified Group - Attended Zoom sessions to be supported with Web 2.0 gamification activities (Kahoot, Quizizz, Google Forms) to support language proficiency with the help of interactive assignments.

AI-Enhanced Group - underwent the same gamified environment with AI-enhanced adaptive learning modules

The online sessions lasted three 45 minutes meetings every week, including, Live Zoom Learning (Concentrated on listening, speaking and group discussion, Gamified practice that includes Quizzes, vocabulary games, and comprehension tasks aimed at establishing motivation and retention, AI Feedback Activities

comprising individualized writing and pronunciation exercises with instant corrective feedback. The AI system was constantly adjusted to the task difficulty according to the performance and patterns of engagement of each learner, providing an individual and encouraging experience.

Phase 3: Evaluation Phase (Week 8)

A post-test and a survey were performed after the instructional period so that to assess the learning outcomes, motivation, and user satisfaction. Post-Test Measured improvement in reading, writing, speaking, and listening relative to baseline scores. Perception Survey gathered the opinions of students regarding the perceived usefulness, effectiveness of the Zoom-AI gamified model and its motivational effect. Teacher Interviews collected qualitative data on the issues of instruction, student engagement, and the use of the platform. The quantitative analysis of performance by metrics like task completion rates, feedback acceptance, trends in accuracy, and time-on-task are recorded automatically. Key activities along with the implementation steps are shown in Table 5 and Figure 1.

Table 5 Implementation steps and activities

Focus area	Key activities
Pre-implementation preparation	Curriculum mapping, content development, platform setup and teacher orientation
Participant orientation and pre-test	Training sessions, working with tools, baseline analysis
Experimental analysis	Intervention, gamified learning modules, AI adaptive feedback and monitoring engagement
Post-intervention tools	Post-tests, perception surveys and data analysis for evaluation

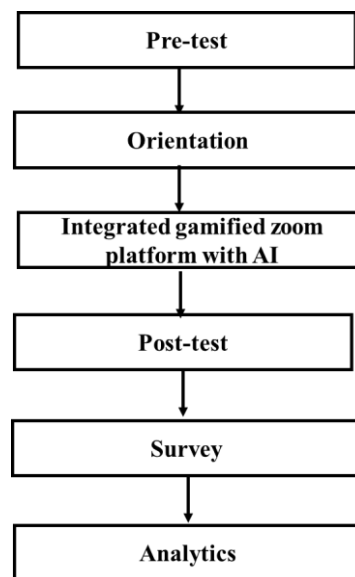


Figure 1 Implementation steps

3.1. Data Analysis and Interpretation

The detailed implementation steps with sub modules of each step are depicted in Figure 2.

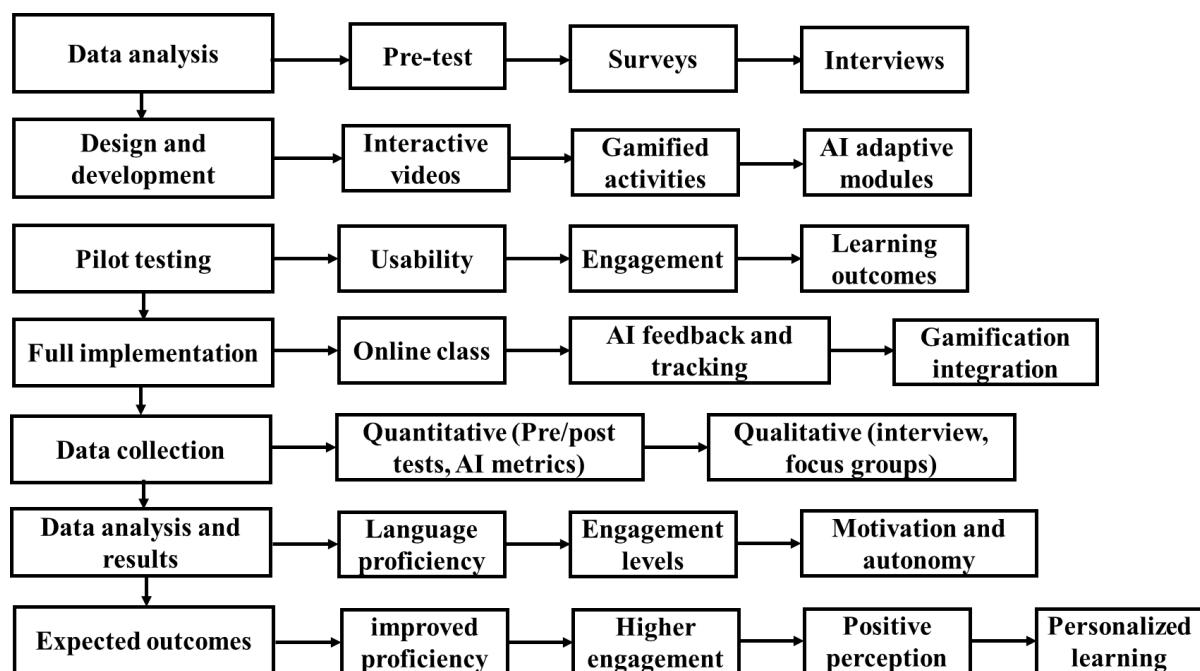


Figure 2 Steps involved in data analysis

3.2. Data collection and monitoring

The study data were collected in the form of Google Forms survey, AI system logs, and Zoom session analytics which allowed both quantitative and qualitative data about engagement and performance of learners. The digital questionnaires were sent to all the participants through email and WhatsApp, which made them

accessible and convenient. Participation was held on a voluntary basis and the confidentiality was ensured. During the implementation period, quantitative and qualitative data were collected in an orderly manner to have a complete picture of the intervention effects.

Quantitative Data:

The improvement in the speaking, listening, reading, and writing skills was measured using pre-test and post-test results. Moreover, the number of engagements, the rate of task accomplishment, attendance history, and performance analytics generated by AI was logged. The AI system provided real time data on the advancement of learners, the customary communication with modules, the level of correctness and the duration of time taken to go through the activities that were aided by AI.

Qualitative Data:

Observation notes, open-ended survey questionnaires, and semi-structured interviews with sampled representatives were the methods of collecting qualitative data. These data were based on perception of the learners in terms of motivation, usability, and satisfaction in the integrated Zoom and AI-enhanced learning model as gamified.

The activity of the learners, including the frequency of the logging in, the duration of the tasks, the accuracy of quizzes, and the usage of the feedback were automatically monitored by the AI analytics dashboard and the built-in Learning Management System (LMS). These objective measures provided more insight into learning engagement and the adaptive behavior patterns between the experimental groups. Questionnaires in the electronic format were distributed through Google Forms to every respondent. The participants were allowed one day to fill the forms and soft reminders made to ensure that maximum numbers of the respondents filled the forms. Every participant received the information regarding the objective of the research, his/her right to withdraw any time, and the guarantee of anonymity and data security.

3.3. Data analysis

Various data sources and tools were used to evaluate the efficiency of the proposed combined Zoom and AI-based gamified learning strategy to the fullest extent. It involved both quantitative and qualitative measurements to allow the reliability, validity and triangulation of the

findings. To determine the level of improvement of the students in reading, listening, writing, and speaking, English proficiency tests were developed on a custom basis which were carried out before and after the intervention. The Cronbach α was determined as 0.89 which is a good internal consistency. To secure content validity, language education experts reviewed the test, and the items were kept in line with the instructional objectives and CEFR standards. The pronunciation competence of learners was evaluated with the help of an Automatic Speech Recognition (ASR) system that became a part of the AI platform. The scoring was checked against the human rater ratings in order to assess the accuracy and consistency of the scoring using the AI-generated pronunciation scores. The inter-rater reliability and the performance of the AI model were checked by using Pearson correlation analysis. The automated scoring module of the essay based on the fine-tuned transformer model that operated using AI offered instant feedback on grammar, coherence, vocabulary, and the general structure of the essay. To ensure the accuracy of the system, the automated scores were compared to the human rubric-based scores, and correlation and t-test tests were conducted to determine the coincidence of scoring and bias elimination.

The integrated Learning Management System (LMS) and AI dashboard were used to monitor learners continuously. The key performance indicators were total amount of time spent learning activities. Quiz participation and rates of task completion. Frequency and adaptive module interaction of chatbots. Feedback acceptance and length of time spent in a session. These measures were objective outcome measures of motivation, persistence and learning behaviors. The data collected in the form of perception was collected using a mixed-methods methodology, that is, both students and instructors were included.

Likert-scale questionnaire questions were evaluated to measure the motivation, usability, engagement, and satisfaction with the blended learning model. Weekly logs which were recorded in terms of instructional experiences and challenges, student progress. The interviews with a

sample of students and teachers will be used to triangulate the quantitative findings, providing qualitative data on the issues of attitude in learners, motivation changes, and the perceived importance of AI and gamification.

The quantitative data (test scores, engagement metrics, survey ratings) were evaluated by SPSS and Excel, and descriptive statistics (mean, SD), paired-sample t-tests, and ANOVA were used to assess the difference between pre- and post-test results between groups. Thematic analysis was also applied to qualitative data (transcripts of the interviews and reflection logs) to determine patterns in the motivating factors, engagement, and perceived improvement of learners.

4. Results and discussion

This paper has explored the efficacy of online instructional integration of Zoom, combined with AI-based gamification methods in the English language learning process. The research was aimed at examining how this blended model influences the development of skills of learners, their confidence, motivation, and attitude towards technology-assisted learning. The follow-up progress of language skills will be enhanced. The findings suggest that the interaction of Zoom in real-time and gamified learning (e.g., Kahoot, Quizizz, AI-adaptive quizzes, etc.) made a huge difference in enhancing the overall language proficiency of students. More than 60 percent of the respondents answered that the connected platform assisted them in enhancing their communication, writing, and reading in English. The average score of 3.88 of the points of communication improvement highlights the relevance of Zoom live video and breakout-room functions that assist in being actively involved, conversing with colleagues, and engage in oral fluency. During the live time students would be able to correct their pronunciation and grammar. Since the gamified activities were facilitated by AI analytics providing them with personal feedback. On the same note, writing and reading had recorded great improvements (mean = 3.82) and (mean = 3.85). The combination of group writing tasks, AI-driven vocabulary recommendation programs, and interactive reading comprehension

games on Zoom sessions provided a prolonged engagement. Such results are consistent with the earlier research that proves that digital collaboration and AI feedback loops may strengthen the understanding and expression abilities.

Table 6 Result analysis

Variable	Mean
Communication skill improvement	3.88
Writing skill improvement	3.82
Reading skill improvement	3.85
Confidence in English usage	3.67
Motivation for learning English	3.68
Technology enhanced learning	3.69
Vocabulary enrichment	3.72

4.1. Confidence

About 60% of students said that they felt more confident in English communication and writing with mean scores of between 3.65-3.78. Through the gamified design, such as points, leaderboards, and adaptive AI feedback, the participants were motivated to take risks and become less anxious, which enhanced oral fluency. The AI progress tracker gave a visual presentation of the performance trends, which enhanced autonomy and self-efficacy of the learners with time.

4.2. Motivation

One of the most powerful results appeared to be motivation. More than 60 percent of the learners reported to be more motivated by learning through the AI-Gamified Zoom framework (mean = 3.62-3.75). The instant feedback systems and gamified challenges provided the traditional lessons with the interactive dynamic and rewarding experience, whereas the engine of artificial intelligence helped to maintain the engagement by changing the level of the task.

4.3. Attitude

The students showed a favorable attitude towards AI-assisted learning in English, as 64

percent of them stated that the hybrid system facilitated and comfortable learning (mean = 3.68). Students stressed that gamified AI activities helped them to have fun studying a language and no pressure, and Zoom features provided them with an opportunity to interact.

4.4. Statistical evaluation

Table 7 Statistical evaluation

Skill	t-value	p-value
Speaking	9.32	<0.001
Writing	8.57	<0.001
Reading	8.91	<0.001
Listening	7.82	<0.001

Significant performance gains were found by quantitative validation using SPSS v26. Comparisons of pre- and post-tests with paired-sample t-tests revealed that the language skills improved in all directions: The statistical results are interesting pieces of evidence to the success of incorporating AI-enhanced gamification into the process of teaching English language through Zoom. The outcomes are always characterized by massive changes in the general English language of learners especially the speaking, writing, and reading skills. The results of the paired-sample t-tests prove that all the language areas studied had statistically significant improvements ($p < 0.001$) between pre-test and post-test, which validates the hypothesis that the combination of AI and gamification positively influences the result of language learning. The most significant change was in the area of speaking ($t = 9.32$), which could be explained by the fact that AI-powered speech recognition (ASR) feedback was used and Zoom breakout sessions during which the oral practice could be conducted in real-time. The outcome is in line with the earlier study by Stocker (2020) and Putra and. The assertion made by Priyatmojo (2021) who wrote that oral fluency is enhanced by interactive online platforms and trust of students through the prolonged communication process and immediate feedback. The writing domain ($t = 8.57$) was also defined by the important improvement of post-test. performance which shows that writing with AI-assisted feedback was significant in improving. grammar, logical

organization of sentences and the richness of lexical means. These returns are indicative of performances by According to Govindarajan (2020), who mentioned that digital-native learners (Gen Z) work effectively in an environment. in which they can gain immediate, subjective, and visual feedback-functionalities inculcated in the AI-based modules applied in the present research.

In addition, the correlation analysis showed that motivation and achievement ($r = 0.78$) were strongly positively related and the confidence and the communication proficiency ($r = 0.74$). These associations point to other variables of affect such as self-efficacy and intrinsic. The value of motivation on the success of learning is highly mediated. It aligns with the concepts of the Self-Determination Theory (Deci and Ryan, 2000), which assumes that learners exhibit increased persistence and success once the sense of autonomy, competence, and relatedness is facilitated, which is evident under the conditions of the interactive and customized design of the AI-gamified learning model. This analysis is further reinforced by the multiple regression which revealed that motivation ($b = 0.42$) and engagement ($b = 0.36$) had the highest predictive power of learning achievement and they collectively accounted 68 percent of the variation ($R^2 = 0.68$). This shows that in addition to content mastery, long-term engagement and emotional interaction are important in the process of language learning using technology. The gamified elements, such as badges, points, and leaderboards, were used to keep the learners interested, whereas adaptive sequencing, which was based on AI, ensured that the learners had the correct level of challenge, preventing boredom and cognitive overload. The research instrument was also found to be robust by evaluating its reliability (Cronbach $\alpha = 0.89$) which guaranteed internal consistency and validity of the data obtained. This consistency provides more validity to the statistical results and confirms the efficacy of the research design to quantify the actual improvements of students.

4.5. Pre-test and post-test comparison

Ongoing comparisons of the results of ANCOVA, the results of the mean gains in the

three experimental groups also help to demonstrate the difference in the effect of the instructional design.

Table 8 Comparison of ANCOVA test results

Group	Pre - test	Post -test	Mean gain	p-value	Effect size
Control	56.8	67.4	10.6	0.041	0.52
Gamified (Non-AI)	55.9	74.2	18.3	0.009	0.86
AI-enhanced gamified	56.1	82.6	26.5	0.001	1.23

Although the improvement of all groups took place, the AI-Enhanced Gamified Group had the biggest learning gain (mean gain = +26.5, $p = 0.001$, $d = 1.23$), more than the Non-AI Gamified Group (mean gain = +18.3, $p = 0.009$) and Control Group (mean gain = +10.6, $p = 0.041$). The high effect size (Cohen $d=1.23$) shows that language achievement was greatly affected by AI integration pedagogically. The importance of this great gain makes it clear that the use of AI personalization, in the form of adaptive feedback, personalized difficulty levels, and automated performance tracking, enhances the advantages of gamification and synchronous instruction. The trends in changes across the groups also support the idea that simple gamification, as much as helpful in engagement, has no ability to fully deal with the variability of learners or motivate them over time. The AI-enhanced design, however, offered customized pathways, which enabled the learners to advance to their pace, thus facilitating mastery and self-confidence. The observation corresponds to Szymkowiak et al. (2021), who focused on the fact that Gen Z learners enjoy adaptive, interactive, and feedback-driven settings that reflect their online experience during learning. On the whole, statistical validation and comparative group analysis prove that the Zoom

English language teaching, gamified and supported by the AI should be discussed as providing a holistic and data-grounded model of teaching. It manages to combine the real time communication, adaptive learning and motivational reinforcement to promote not only the linguistic competence but also the affective and behavioral engagement. The evidence in this way confirms the main argument of the study: AI-based personalization and feedback parks based on the game play a major role in enhancing the quality and richness of online language learning.

5. CONCLUSION

The proposed study analysed the effect of combining AI based gamification approach and zoom based online learning for English language learning and the implications suggest that AI-driven methods with gamified module increases the proficiency, learner engagement and motivation. The quantitative analysis shows that the obtained reliability and validity measures provided better post-test improvements in reading, writing, listening and speaking practices. The AI-enhanced gamified module has attained good learning gains and the model's performance is evaluated by observing the adaptive feedback, task sequencing and making the learners engaged through different activities and rewards strategy. The positive correlations highlight the role of behavioural factors in online learning. In addition, the method provides student-centric and tech-oriented English instruction which is highly interactive for Gen-Z learners. This learning method focuses that AI modules assist teachers by assigning tests automatically, tracking performance and learner needs and adapt the process accordingly in real time. The proposed strategy combines human intervention with intelligent automation technique to provide engaging, adaptive learning system. In future extension, the combination of Virtual reality (VR) with AI-based learning system can be demonstrated.

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