

Enhancing TOEFL ITP Performance through the Development of an Innovative Web-Based Online Testing System

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ABSTRACT

Web technology offers abundant resources for educators and learners in the process of teaching and learning English. This research focuses on developing a web-based online test for the TOEFL ITP, tailored to the needs of learners and educators at Universitas Darussalam Gontor. The novelty of this study lies in the development of a comprehensive TOEFL ITP system that evaluates all three key skills: listening, structure and written expression, and reading, while also incorporating a scoring feature to evaluate learners' performance. To address the challenges of online test development, the study utilized the Instructional System Design (ISD) model developed by Alessi and Trollip (2001). The formative evaluation process involved assessing the system's impact through a pre-test and post-test comparison, with the primary goal of enhancing learners' TOEFL ITP performance and motivation. A paired-sample t-test was employed to analyze the improvement in learners' performance. Results revealed a mean score increase from 469.12 (pre-test) to 532.36 (post-test), a difference of 63.24. The t-statistics of -9.03 and p-value of < 0.01 confirmed that the improvement was statistically significant. Additionally, learners' motivation showed a gain score of 0.53, indicating a notable increase in motivation after engaging with the web-based test system. These results demonstrated that integrating web-based systems into TOEFL preparation has substantial benefits for learners' engagement, performance, and cognitive development. The study also highlights the potential of using such technology in providing more accessible and interactive learning experiences for learners in various educational settings.

Keywords: TOEFL ITP, Performance; WEB, Online Test

Introduction

Test of English as a Foreign Language Institutional Testing Program (TOEFL ITP) as an English proficiency test is used to assess non-native speakers' capacity to use and comprehend the language in educational contexts (Anam et al., 2017; Golubovich et al., 2018). It plays a crucial role in the academic world, particularly for individuals aiming to pursue studies at international universities or participate in English-language programs. The test comprehensively measures proficiency in listening, reading, structure and written expression that are essential for success in academic environments (Kalantar, 2023; Nirwaty, 2020). TOEFL ITP also serves as a benchmark for institutions to assess an individual's readiness to engage with coursework, understand academic materials, and communicate effectively in global classrooms. Mastering TOEFL not only supports academic aspirations but also strengthens global competitiveness (Sasayama et al., 2021)

Ukhrowi (2024) discusses the use of websites as platforms for TOEFL practice, providing reading and structure questions but excluding the listening component. The primary restrictions of this platform are the limited number of questions and the absence of the listening section, which is essential in a full TOEFL assessment. However, the web provides flexible access, enabling users to practice anytime and anywhere according to their needs. These studies by Aprilliandari and Sugiharto (2023) and Ukhrowi (2024) examine the use of websites for TOEFL practice, which offers a limited number of questions in the Listening, Reading, and Structure sections. Although the limited number of questions is a drawback, users can still access various types of practice conveniently. Additionally, the platform provides flexibility, allowing users to practice from anywhere and at any time, even though it lacks scoring features that could help assess their progress. Istighfaroh et al. (2023) study ELT learners'

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awareness and attitudes regarding the use of web-based online tests for English learning. The findings demonstrate that learners feel positively about these resources and grow more knowledgeable about the online resources utilized in the English language learning process. The online setting supports learners in independently evaluating their learning objectives and promotes self-regulated learning.

Based on the background outlined, there are scarcities in research related to the use of the web to evaluate the TOEFL ITP test, particularly concerning the quantity and types of questions that align with the standards set by Educational Testing Service (ETS). Previous studies have shown that TOEFL training has not met the number of questions recommended by ETS, resulting in an inadequate assessment of the test-takers' academic abilities (Kalantar, 2023; Sasayama et al., 2021). This issue highlights the need to develop a web-based platform that can provide a more varied set of TOEFL ITP questions that meet ETS criteria. In addition to meeting ETS criteria, this application also includes a scoring feature, allowing users to view their scores after completing the test. Therefore, this research focuses on addressing this gap to ensure that the evaluation of English language proficiency in an academic context can be performed more accurately. One of the key significances of this study is the development of a web-based platform that lets learners access TOEFL practice materials anytime, anywhere, offering a more flexible and convenient approach to preparation. This feature is especially significant in the context of modern education, where learners are increasingly seeking independent, self-paced learning opportunities. By offering a platform aligning with ETS standards and including a scoring system for immediate feedback, this research contributes to enhancing learners' English proficiency outside of traditional classroom settings, assisting them in better preparing for academic challenges. The research aimed to address this problem by creating an application that satisfies TOEFL proficiency test requirements and assessing learners in maximizing their academic proficiency. It sought to explore the following research questions:

1. How can a web-based online testing system be facilitated for the TOEFL ITP?
2. To what extent are the learners' learning motivation and learning outcome after implementing TOEFL ITP online test?

Literature review

TOEFL ITP and Performance Factor

TOEFL ITP is designed to assess English language proficiency through three core components (Apriliandari & Sugiharto, 2023; Ariamanesh et al., 2023; Ukhrow, 2024). Understanding spoken English is assessed in the listening comprehension section in academic settings, such as classroom discussions and conversations, requiring test-takers to grasp both main ideas and details. The structure and written expression section evaluates mastery of English grammar and the ability to recognize correct sentence structures and avoid errors in written academic language, a skill crucial for producing clear, professional writing (Istighfaroh et al., 2023). Meanwhile, the ability to read and comprehend challenging academic texts, analyze content, make deductions, and recognize key ideas is assessed in the reading comprehension section (Fleckenstein et al., 2020; Sadeghi et al., 2021). Although TOEFL ITP does not include speaking or writing sections, it provides a reliable assessment of essential skills for non-native speakers who need to navigate the demands of academic reading and listening. This makes it particularly useful for institutions that need a standardized test to evaluate English proficiency in an academic setting.

Practice questions and exam simulations have a crucial role in enhancing TOEFL ITP performance by helping learners effectively prepare through familiarity with the test format and by optimizing the language skills assessed. Practice questions include a range of TOEFL ITP questions which aim at training participants on question patterns and enhance answer accuracy. Varied question types, such as multiple-choice, error identification, and reading comprehension, provide opportunities for participants to identify weaknesses and refine answering strategies. Meanwhile, exam simulations serve as a realistic test experience, including time constraints and question formats similar to the actual test, allowing test-takers to acclimate to the time pressure and real test conditions (Ariamanesh et al., 2023). Through consistent practice, the participants are able to develop resilience, confidence, and better time management, all of which contribute to enhanced performance on the TOEFL ITP.

In the context of this study, Daniels (2016) provides a valuable framework for understanding how learners interact with and internalize the content of the TOEFL ITP test. Daniels (2016) argues that learning occurs through social interaction and mentorship, particularly within the Zone of Proximal Development. The web-based TOEFL test functions as a tool for scaffolding learners' progress, offering organized support through feedback that helps learners from their current abilities to more advanced proficiency. The formative assessment model proposed by Xuan and Wishart (2022) highlights that assessment should go beyond merely evaluating performance; it should actively contribute to the learning process. The web-based TOEFL ITP test embodies this principle by offering real-time feedback that helps learners understand their strengths and weaknesses. According to Xuan and Wishart (2022), formative assessments enable learners to identify areas for improvement, guide instructional decisions, and ultimately enhance learning outcomes. The ongoing feedback offered by the web-based system reflects this model, as it empowers learners to monitor their progress and adjust their strategies, accordingly, promoting a more engaging and learner-centered approach to TOEFL preparation.

The study employs Self-Determination Theory (SDT) by Yuerong et al. (2024), which posits that motivation is shaped by three key factors: autonomy, competence, and relatedness. The web-based TOEFL ITP test supports autonomy by allowing learners to learn at their own pace within a flexible setting. It fosters competence by providing immediate feedback, enabling learners to track their progress and refine their skills. Furthermore, the engaging and interactive nature of the test fosters relatedness, as learners feel more connected to their learning goals through supportive online platform. Incorporating SDT highlights, this study demonstrates how the web-based test can not only boost learners' performance but also increase their intrinsic motivation by fulfilling their psychological needs for autonomy, competence, and relatedness.

Web-based online testing system

A website is a collection of interconnected digital pages accessible via the internet, serving as a medium to present information, services, or interactive applications to users (Aljraiwi, 2019). Websites are essential for supporting online tests like TOEFL as they provide an accessible, efficient, and well-structured platform for test-takers (Iyamuremye et al., 2024). With features such as automatic registration systems, exam scheduling, and integration with proctoring software, websites ensure the security and accuracy of the test administration. Additionally, their wide accessibility allows participants from various locations to take the test without physical presence, saving time and costs (Alsuhaibani et al., 2024; Aydos et al., 2022). Websites can also store test results and offer immediate feedback, which greatly assists in the evaluation process (Chandra & Qomariyah, 2022; Hsu, 2024).

The use of web-based online testing systems in education has offered significant advantages in improving learner performance, reducing exam-related anxiety, and facilitating faster feedback. These systems let learners take exams remotely and at flexible times, improving accessibility and creating a more comfortable testing environment. Study indicates that online testing positively impacts learners' performance by providing adaptive question formats and instant feedback, enabling learners to identify areas for enhancement promptly (Ariamanesh et al., 2023). Additionally, the immediate scoring and automated feedback reduce delays in learning adjustments, getting educators to tailor their instruction more effectively to individual learners' needs (Aljraiwi, 2019). Lowering the stress often associated with traditional exams through a more familiar digital interface, online testing systems create an environment that supports both academic performance and learners' well-being.

Challenges in Thai EFL Writing Instruction

Thai EFL students face significant difficulties in idea generation, argument organization, and the use of cohesive devices (Wonglekha & Khamkhien, 2022). Traditional instruction often prioritizes grammar drills and memorization over meaningful writing practice, limiting exposure to well-structured academic texts. Additionally, exam-oriented teaching reduces opportunities for process-based writing tasks. These constraints suggest a need for strategies that increase both exposure to and awareness of essential writing structures without drastically altering existing curricula (Laksanasut, 2024).

Input Flooding: Enhancing Fluency and Accuracy

Input flooding involves repeated exposure to specific linguistic forms to promote acquisition. Studies indicate that sustained exposure to transitional phrases and complex structures improves EFL students' fluency and accuracy in writing (Alwaheebi, 2024). For Thai learners, who typically lack rich linguistic input, this approach may provide the necessary scaffolding to internalize advanced structures. However, some research suggests that input flooding alone may be insufficient, particularly for students who require explicit attention-directing mechanisms to fully process new forms (Salih, 2023).

Input Enhancement: Promoting Conscious Noticing

Input enhancement supplements input flooding by highlighting key linguistic features using boldface, underlining, or other visual cues (Susoy & Zarfsaz, 2024). Aligned with Schmidt's Noticing Hypothesis, this technique helps students recognize and adopt complex syntax, cohesive devices, and grammatical structures essential for clear and coherent writing. Empirical studies have shown that enhanced input increases the likelihood of retention and application of target forms in student essays (Salih, 2023).

Research methodology

This research developed an online test for TOEFL ITP section, created using react.js for the front-end and node.js for the back end. The development process followed a research and development model based on the framework proposed by (Alessi & Trollip, 2001). This model incorporated three essential attributes of Instructional System Design (ISD): standards, evaluation, and project management, which were central to the design and development process, establishing a solid foundation (Alessi & Trollip, 2001). By clarifying the standards, the design development was closely monitored to meet benchmarks. Furthermore, continuous evaluation was conducted at each stage, utilizing a continual iterative approach until the desired functionalities were achieved. The process of development was adaptable, with each step contingent upon the outcomes of the previous one. Additionally, project management was a significant focus within the Alessi and Trollip (2001) ISD model, ensuring the online test was completed within the set timeframe and budget. Any delays were addressed while maintaining standards (Nugroho & Arrosyad, 2020). Figure 1 below illustrates the Alessi and Trollip (2001) model.

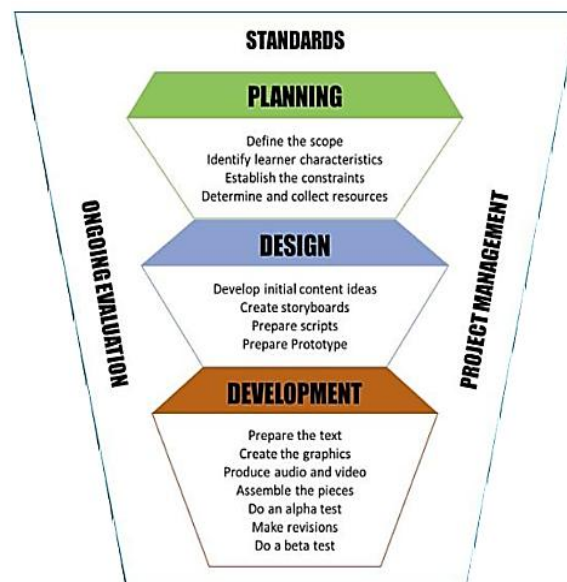


Figure 1 The Design Model for the Alessi and Trollip Instructional System

A web-based online testing system for the TOEFL ITP test was created using the three stages of Alessi and Trollip (2001)'s Instructional System Design (ISD): planning, design, and development. The planning phase aimed to ensure that all system aspects functioned effectively, encompassing defining the study's scope, identifying learner characteristics, establishing the boundaries of the web-based test, determining the format of the instructional manual, and conducting initial brainstorming sessions (Hakim et al., 2021). The design phase was the most creative, focusing on content assembly and deciding how to create an interactive and instructional online test system that supports learners in achieving their learning outcomes (Nurrahmi & Putri, 2024). During this stage, task and concept analyses were carried out, and storyboards and flowcharts for the online test were created. Converting the design into a web-based online system for the TOEFL ITP test was the last stage. The process of development involved teamwork and required the creation of reading materials and supplementary materials in addition to a variety of programming and graphic design abilities.

Product testing was divided into two categories when creating the web-based online testing system for the TOEFL exam: determining the system's viability and analyzing its efficacy. Alpha testing (validation by media and material experts) and beta testing (learner assessments) were both included in the feasibility testing process. The information gathered from these assessments was examined to enhance the final product, making sure that the media produced better matched the requirements of the learners. Summative tests were used to gauge the product's efficacy and ascertain whether learners' scores, motivation, and general accomplishment improved after the developed product was put into use.

The ISD model by Alessi and Trollip (2001) was particularly suitable for the development of a TOEFL online testing system due to its structured approach to planning, design, and development. The model facilitated a clear alignment between educational goals and the necessary system features. Its flexibility allowed adaptations during each phase based on feedback and evaluation results, making it well-suited for creating an interactive TOEFL ITP system. Additionally, the focus on standards and continuous evaluation ensured that the final product adhered to educational standards while supporting learners' cognitive development at the formal operational stage.

Participants

The summative assessment involved 65 male learners in their second semester from the International Relations major at Universitas Darussalam Gontor, Indonesia. All participants were chosen based on their academic performance. It is noteworthy that all the respondents were male, for the sampling was drawn from the university's campus A, where only male learners are enrolled. The university operates a pesantren (Islamic boarding school) system, where male and female learners are separated across different campuses. Female learners attend campus C, while campus A is designed for male learners. The participants represented a wide range of socio-economic backgrounds, with some hailing from urban areas and others from rural regions. Their English proficiency levels varied, with some learners having higher proficiency due to previous exposure to English-language programs, while others had more limited abilities. This demographic diversity contributed to a thorough evaluation and improved the generalizability of the results.

Instrument

Creating a high-quality development product requires the use of several well-defined instruments to evaluate various aspects of the research process. These instruments involved: (1) the primary instrument, which was a questionnaire designed to examine the quality of the web-based learning system. The questionnaire targeted two primary components: the content and the media, both of which were validated by subject matter experts. Additionally, the TOEFL ITP scores were used to measure enhancements in learners' cognitive performances by comparing pre-test and post-test results. This allowed for a direct evaluation of learners' progress; (2) supporting instruments, which included observation sheets to collect data on learners' characteristics, ensuring the accuracy of the design and the product. Additionally, interviews with product developers were held to obtain further insights, including feedback, suggestions, and critiques that were not captured by questionnaire.

Data Collection

The current study gathered several types of data including learners' opinions about the multimedia products, questionnaires about the created web platform, and validation results from media and content specialists. Together with information on learners' motivation and their pre- and post-test scores that reflected learning outcomes, these responses were transformed into a five-point scale

Data Analysis

Aspects of instructional quality (like instructional flexibility, testing, and assessment quality) as well as the quality of content and objectives (like accuracy, completeness, relevance, and suitability for the user's context) were among the criteria used to assess the web-based online TOEFL ITP test's quality. The web-based online test's evaluation criteria, which were adapted from Alessi and Trollip (2001), were centered on technical quality (which covered data storage and privacy, accessibility and stability, media compatibility, non-web contact information and program limitations) and display quality (which included text, colors, images/graphics, screen design, and navigation). Additionally, media attractiveness which included text, images, colors, materials and tests, screen design, user interface, communication features, and language was the main focus of assessing learners' impression of the web multimedia.

Since the experts offered recommendations and input on the created web-based online test, the formative evaluation's feedback from questionnaires and in-person interviews with media and material experts was compiled in a table without being transformed into quantitative data. In contrast, the summative assessment entailed comparing the data from pre-test and post-test to ascertain whether the outcomes of learning had improved, and evaluating questionnaire of learning motivation with a numerical scale based on a Likert scale. N-gain, which represents the normalized average score gain (g), was used to compute the improvement in learning outcomes prior to and following the adoption of the web-based online TOEFL ITP test. The gain score was calculated by comparing pre-test and post-test results; the highest gain score indicated the greatest possible improvement. Hake (1999) states that the following is the expression for the normalized average gain (N-gain). The result of N-Gain average calculation was interpreted using this criterion in Table 1.

$$g = \frac{S_{post} - S_{pre}}{S_{maks} - S_{pre}}$$

Table 1 Division of Gain Score

Score	Category
N-Gain < 0,3	Low
0.3 N-Gain ≤ 0,7	Medium
N-Gain ≥ 0.7	High

In addition to the N-gain, the paired t-test was employed to analyze the difference between pre-test and post-test scores. This statistical test calculated the mean difference between the paired scores (post-test minus pre-test scores) and divided it by the standard deviation of the differences, adjusted by the square root of the sample size (McMillan & Schumacher, 2010). The result of the t-test determined if the difference in scores was statistically significant, providing insight into whether the web-based TOEFL ITP test led to meaningful improvements in learners' performance. t-value indicated that the observed improvement was unlikely to be due to random chance. The test results contributed to a deeper understanding of how the system helped learners' academic skills over time.

Results

How can a web-based online testing system be facilitated for the TOEFL ITP?

1. Planning Define the scope

The TOEFL ITP test was utilized in the present study. This test consisted of two main sections: practice 1 and practice 2. Each section was composed of Listening Comprehension (50 questions, 35 minutes), which tests understanding of conversations and lectures; Structure and Written Expression (40

questions, 25 minutes), which measures the skill to identify appropriate grammatical structures; and Reading Comprehension (50 questions, 55 minutes), which assesses the ability to understand academic texts. These two materials served as the core foundation for building conceptual understanding TOEFL ITP test.

2. Identify Learner Characteristics

At the formal operational stage, learners exhibited more logical and systematic thinking, which allowed them to be more self-reliant in learning. They utilized modern resources such as the internet, notebooks, and smartphones to stay informed and organize material. Capable of abstract thinking and complex problem-solving, they were well-equipped to face advanced academic challenges. This stage also involved increased self-regulation, critical thinking, and goal setting. Based on these characteristics, this study created a web-based TOEFL ITP test to support their cognitive abilities and encourage independent learning.

3. Establish the Constraints

When developing the web-based TOEFL ITP testing system, various constraints were addressed to ensure the system with educational goals. Technological factors such as device compatibility, internet bandwidth, and server capacity were considered to ensure accessibility across platforms. The system was also required to meet TOEFL ITP standards set by ETS, ensuring the correct types and numbers of questions for accurate assessment. User experience was a key constraint, demanding intuitive design that catered to learners' cognitive abilities at the formal operational stage, promoting independent learning. Furthermore, time and budget constraints guided the development process, requiring efficient resource management. Lastly, the system had to comply with accessibility guidelines, ensuring inclusivity for all learners.

4. Produce a Style Manual

(1) The homepage, test page, course page, information page, log-in page, and forum page were the six primary menus that made up the website layout. To make the learning environment more engaging, the test-page design was altered for every question level. (2) Courier New and Pristine fonts were used in the text; the material text was 12 points in size, while the homepage text and material titles were 16 points. (3) The website theme eschewed the use of bold icons or characters in favor of a minimalist template with a modern, futuristic design. (4) White and light blue were the template's primary colors. (5) Users only had to enter their username to access the user-friendly web-based test. (6) Keeping with the modern and futuristic theme, the navigation buttons were made to be aesthetically pleasing.

5. Design Conduct Task and Concept Analysis

The online version of TOEFL ITP test was designed to enhance English proficiency. It served as an interactive test platform that users could access anywhere for self-directed learning. The web utilized Macromedia Flash to create engaging animations and a visually appealing interface. This test promoted independent learning and shifted the focus from teacher-centered to learner-centered learning, helping learners improve their performance and achieve mastery. The passages of TOEFL ITP were designed with attention to word size, sentence length, and linguistic features to support comprehension. The available task types on the web-based TOEFL ITP test included listening, reading, structure and written expression.

6. Create Flowcharts and Storyboards

The basic flow or order of operations within the multimedia web system when accessed by users was depicted in flowcharts for the web-based test. After flowcharts were created, a storyboard was made to show the web product's initial visual design. Included in this were the test pages, material display, logo, main menu, and other features. The following flowchart illustrates how to use the web-based test according to the specified procedure.



Figure 2 The Procedure for Accessing TOEFL ITP Online Test

7. Development

The web-based online test for TOEFL ITP was developed using PHP programming and supported by a variety of tools, including Adobe Flash CS3, Notepad++, Corel Draw X4, Adobe Photoshop CS3, and Adobe Illustrator. Development began by preparing the materials and designing the interface, including menu content. Next, the programmers initiated the coding process following the established storyboards and flowcharts. Role-Based Access Control (RBAC) was implemented to define user roles, which included web manager, lecturer, and learners. Once coding and integration of media components were complete, the server as well as the website domain was finalized at <https://engrtest.unida.gontor.ac.id/>. Below is the web page profile for TOEFL ITP online test.

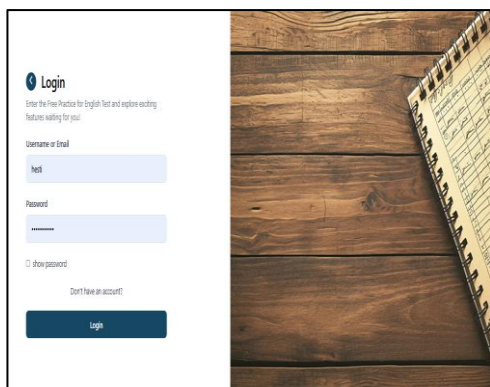


Figure 3 Register Form

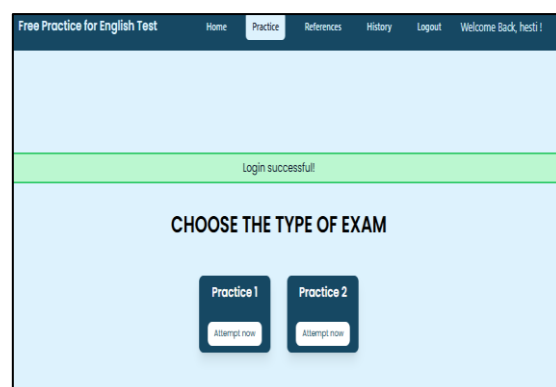


Figure 4 Test Platform

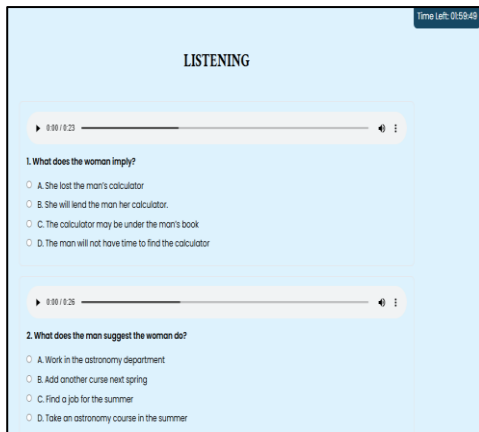


Figure 5 Listening Section

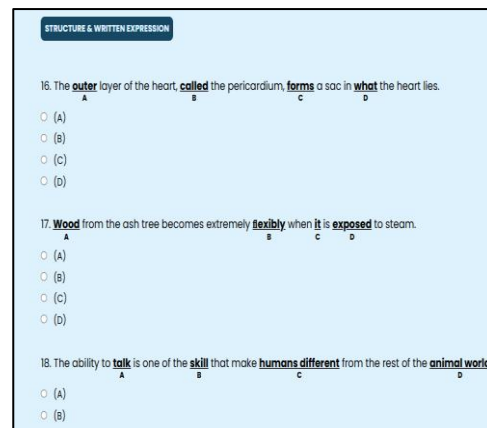


Figure 6 Structure & Written Expression

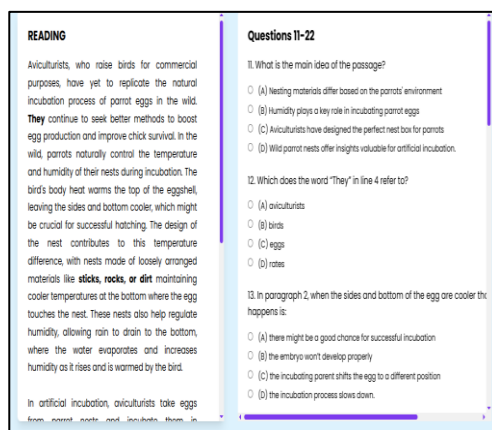


Figure 7 Reading Comprehension

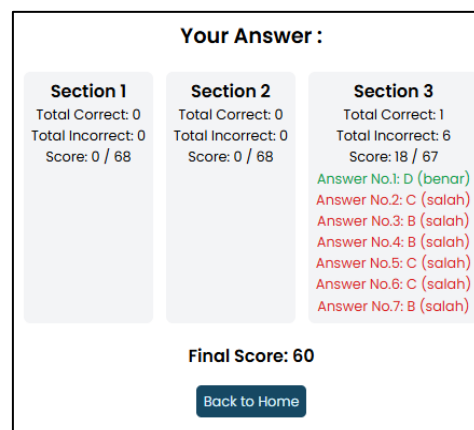


Figure 8 TOEFL ITP Score Figure

After the web-based TOEFL ITP test's multimedia learning was created, its viability was assessed before it was incorporated into the learning process. Alpha testing (product validation) and beta testing (user feedback) were the two testing phases that made up this formative assessment. Internal media specialists and TOEFL specialists were principally responsible for validation during alpha testing. While the media validation sought to assess the media programs' display and functionality, the material expert validation concentrated on determining whether the content was appropriate.

Subsequent examination of the validation results revealed that the web-based online TOEFL test coverage satisfied the exam's validity requirements. Media experts' comments verified that each component's corresponding indicators had been met. Nonetheless, it was evident from the media validation results that some media elements did not satisfy the required standards for accessibility and appearance. Although some improvements were required to produce a more practical multimedia product, the online test could still be used as part of the overall learning process. The web-based online test system was prepared for additional testing after these enhancements were made.

Table 2 The Assessment of Media Expert

No	Aspect	Score
1	System Management	4.38
2	User Interface	4.41
3	Educational Value	5.36

According to the media experts' feasibility assessment (Table 2), the online test's management component scored 4.38, which was considered "very good," and the user interface received a score of 4.41, which was also considered "very good." Media experts gave the web-based online test a 5.36 rating for its educational value. After reviewing each of the TOEFL ITP practice materials, the experts assessed the products based on two criteria: practicality and effectiveness. Practicality was reflected in the ease of accessing the TOEFL ITP practice test online and its applicability in the TOEFL class, while effectiveness was characterized by the usefulness of the materials for the TOEFL course. According to the feedback from the material experts, content validity in TOEFL ITP test scored above 4.21, indicating a "very good" category, alignment with TOEFL standards scored 4.13 categorized as "very good", and clarity and accuracy of language reached 4.28, also in the "very good" criteria. A questionnaire measuring media attractiveness served as the research tool for the beta test. Learners were requested to study and interact with every aspect of the online TOEFL ITP exam. Once the learning activity was considered adequate, learners took a test to evaluate their performance on the TOEFL ITP. Additionally, an impression questionnaire regarding the web multimedia was given to the learners, and the data obtained were analyzed using a Likert Scale (see Table 3).

Table 3 Result of Web Multimedia Impression

No	Aspect	Score
1	Combination of color	3.78
2	Presentation of Menu	4.30
3	Text Clarity	4.48
4	Web based instruction	4.28

Based on the feedback provided by the learners (Table 3), the website's color combinations received a score of 3.78 (good category), the menu presentation received a score of 4.30 (very good category), the text's clarity received an average score of 4.48 (very good category), and the website's usage instructions received a score of 4.28 (very good category). These findings demonstrated that the web-based online test successfully improved learning outcomes, with a gain score increase of 0.40 (medium-g courses).

To what extent are the learners' learning motivation and learning outcome after implementing the TOEFL ITP online test?

In this research, apart from gathering data from the pre-test and post-test, an additional focus was placed on assessing learners' motivation for the summative evaluation. This motivation assessment was conducted using an attitude questionnaire, which initially provided qualitative data. This data was transformed into quantitative form using a Likert scale in order to be further examined. Learners' motivation performance averaged 2.08 during the pre-test phase, but the average score rose to 3.62 during the post-test. The comparison between these two mean scores allowed the calculation of a gain score, revealing a significant difference in motivation levels before and after utilizing the online test. The main gain in motivation was found to be 0.53 (medium-g courses), indicating that learning motivation notably improved after the learners engaged with the TOEFL ITP web-based online test.

For further evaluation, a summative assessment was conducted through a classroom trial involving 65 learners, where they engaged with the web-based online test system. Prior to the trial, an offline TOEFL ITP pre-test was administered to assess the learners' initial cognitive abilities related to the TOEFL ITP test. The expectation was that 70% of the learners would achieve the passing grade of a TOEFL score of 500, indicating that the test materials were appropriate for the learners' level of proficiency. However, the results from the pre-test revealed that only 43% of learners managed to reach this target.

In contrast to the pre-test outcomes, where the average score was 469, the post-test results showed considerable improvement, with an average score of 532. Most learners passed the post-test, with seven learners considered incomplete. The enhancement in learning outcomes from the pre-test to the post-test led to a calculated gain score of 0.6, highlighting the effectiveness of the web-based online test in improving learners' performance in the TOEFL ITP. To further assess the significance of this improvement, a paired-sample t-test was performed. See Table 4 for the results of the paired-sample t-test.

Table 4 Paired-Sample t-Test Results

Statistic	Pre-test	Post-test	Difference
Sample Size (N)	65	65	65
Mean Score	469.12	532	63
t-Statistic	-9.03		
p-value	< 0.01		

Based on Table 4, the paired-sample t-test results revealed a mean score increase from 469.12 (pre-test) to 532.36 (post-test), indicating significant improvement in learners' performance after using the web-based online test system. The t-statistic was -9.03, showing a substantial difference between the pre-test and post-test scores. The p-value of < 0.01 was far below the typical significance level of 0.05, confirming that the observed improvement was statistically significant and not due to random chance. Overall, the study demonstrated that the web-based online test not only enhanced learners' motivation but also supported their cognitive development, reflected by the improved scores. These results suggested that integrating technology into TOEFL preparation offered substantial benefits for learners' engagement and performance.

The practical implications of these results are substantial. The web-based system provides learners with flexible access to practice materials, immediate feedback, and the ability to independently engage with content. These features promote learner autonomy and motivation, which are crucial for effective modern test preparation. This is especially important in contexts where learners may not have reliable access to traditional classroom-based resources or instructors. Beyond these general benefits, the system should be further improved by incorporating a wider range of test questions across various skill areas. The inclusion of three distinct types of questions: listening, reading, and structure would facilitate a comprehensive preparation experience. Listening exercises help improve learners' comprehension of spoken English, while reading exercises evaluate their comprehension of written materials. Structure-based questions would focus on grammar and sentence construction, ensuring comprehensive coverage of the skills necessary for the TOEFL ITP test.

Discussion

The findings from the web-based TOEFL ITP test study demonstrate its positive impact on learners' academic English proficiency, particularly in enhancing engagement, motivation, and performance outcomes. The user-centered design of the online test system emphasizing ease of navigation, intuitive layout, and clear menu labeling, has promoted independent learning. Positive feedback from both alpha and beta testing phases highlights that the system meets quality standards and is well-received by media and material experts, confirming its usability and validity in supporting TOEFL preparation. These results are consistent with previous research by Hidri and Pileh Roud (2020), revealing that intuitive interfaces significantly enhance learner engagement and performance. Additionally, the findings align with Simkova et al. (2021) and Arifuddin et al. (2023), who suggest that clear organization in online testing platform boosts learners' confidence and supports their performance outcomes.

The feasibility assessment and expert evaluations, which indicated strong content validity and high levels of clarity perceived by learners, demonstrate the system's short-term effectiveness. These results are consistent with previous studies on web-based assessment systems, which have reported that well-designed digital platforms can enhance learner engagement and immediate learning outcomes (Cattaneo et al., 2025; Chandra & Qomariyah, 2022). In addition, while the present study confirms the effectiveness of the web-based TOEFL ITP system in improving test performance, prior research suggests that benchmarking learning gains across different digital testing systems can offer a more comprehensive understanding of their relative effectiveness (Aydos et al., 2022; Boateng et al., 2024; Iyamuremye et al., 2024). Comparing the post-test score improvements observed in this study with findings from larger-scale or multi-institutional studies would help contextualize the results. Furthermore, examining whether the interactive features of the system produce sustained learning benefits across various educational settings, and how these features compare with those used in conventional TOEFL preparation methods, would provide valuable insights into the broader applicability and impact of the web-based TOEFL ITP test.

The web-based TOEFL ITP system yielded positive outcomes across all assessed skills. In listening comprehension, the system enhances learners' ability to understand academic spoken English, aligning with by Hidri and Pileh Roud (2020) and Zakharova et al. (2024) who find similar improvements with interactive listening tools. Reading comprehension also improves, suggesting that the system's academic texts and exercises have positive impact to learners' reading skills, consistent with Alsuhailbani et al. (2024). Structure-based questions also demonstrate improvements, indicating that the system provides valuable grammar practice, although further development in targeted writing strategies might be necessary. Overall, the system contributes to the development of learners' TOEFL skills, highlighting its potential boost performance across multiple areas.

The study emphasizes positive feedback and increased motivation, but it does not fully address potential limitations, such as technological constraints or device availability. Future research should assess the platform's effectiveness for learners from diverse socio-economic backgrounds, who may not have equal access to the necessary technology, as supported by (Sun & Wudthayagorn, 2024). Additionally, further investigation is needed to determine how well the system adapts to the specific needs of different learners, ensuring equitable access to all. Scalability is another crucial consideration; with a small sample size of 65 learners, future studies should examine the platform's effectiveness across larger, more varied populations. Investigating its potential for wider implementation across various educational settings and regions will be essential for broader adoption, particularly in developing countries where access to traditional TOEFL preparation resources may be limited. In line with research by Zakharova et al. (2024), a systematic exploration of the long-term benefits of technology in TOEFL preparation is required, regarding personalized feedback and adaptive learning pathways. Immediate feedback, as highlighted in these studies, plays crucial role for enhancing retention, cognitive development, and overall academic performance.

Conclusion

This study indicates that the use of the web-based TOEFL ITP test has significantly improved learners' learning outcomes and motivation. Data analysis revealed a clear improvement for pre-test and post-test scores, with 79% learners achieving minimum score of 500 after using the platform, compared to only 43% passing in the pre-test. Feedback from learners also showed that the design and functionality of the website supported a better learning experience, with high average scores for text clarity and menu presentation. This suggests that the platform is not only effective in enhancing English language skills but also in boosting learners' motivation to learn. The findings imply that integrating technology into assessment can enhance the effectiveness of English language teaching and provide a platform that supports independent learning. With good design and high accessibility,

the web-based TOEFL ITP test could serve as a viable alternative for language instruction in the future. However, this study has limitations, including a small number of participants and a single testing location; hence, upcoming study is recommended to involve more diverse sample and to explore other factors that may affect learners' learning outcomes, such as differences in student characteristics and teaching approaches used.

Despite the positive outcomes, the findings do not fully account for all dimensions of writing development. Improvements were primarily observed in linguistic accuracy and structural complexity, while higher-level rhetorical skills such as argument development and critical stance were not directly examined. This suggests that input-based instruction, although effective for supporting linguistic resources, may need to be complemented by process-oriented or genre-based approaches to foster more advanced aspects of academic writing. Furthermore, the reliance on short-term post-test measures limits conclusions regarding the durability of learning gains.

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