An Action Research on the Efficacy of Educational English Language Websites in Enhancing Grammar Skills among Engineering Students

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Abstract:

This action research aimed to evaluate the efficacy of educational websites in enhancing the grammar skills of 35 intermediate-level engineering students at MUST University in Egypt, who were enrolled in the summer semester of 2024. The study followed the action research design cycle—planning, implementing, observing, and reflecting—to assess the impact of these online resources on students' grammar proficiency, using a pre- and post-test focused on grammar rules (present continuous vs. present simple; past simple vs. present perfect; narrative tenses and future forms). Additionally, the research explored students' perceptions of these websites, including their views on the role of educational websites in improving EFL grammar mastery, their engagement with the platforms, the influence on their future grammar learning, and their overall satisfaction with using these websites for grammar instruction. The results revealed a significant improvement in students' grammar proficiency, as demonstrated by the positive difference between pre- and post-test scores. Moreover, the questionnaire data indicated that the majority of students perceived the websites as highly effective in enhancing their grammar mastery, found the platforms engaging, and expressed overall satisfaction with their use. Many students also reported that these websites positively impacted their future approach to learning grammar.
Key words: action research, educational English language websites, grammar skills

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بحث إجرائي حول فاعلية المواقع التعليمية للغة الإنجليزية في تعزيز المهارات النحوية لدى طلاب كلية الهندسة

مستخلص البحث

هدف هذا البحث الإجرائي إلى تقييم مدى فعالية المواقع التعليمية في تعزيز المهارات النحوية لدى ٣٥ طالب هندسة بالمستوى المتوسط للغة الإنجليزية بجامعة مصر للعلوم و التكنولوجيا MUST في مصر، والذين التحقوا بالفصل الصيفي لعام ٢٠٢٤. اتبعت الدراسة دورة تصميم البحث الإجرائي – التخطيط، التنفيذ والملاحظة والتأمل – لتقييم تأثير هذه الموارد عبر الإنترنت على إتقان القواعد النحوية لدى الطلاب، باستخدام اختبار قبلي وبعدي يركز على القواعد النحوية (المضارع المستمر مقابل المضارع البسيط؛ الماضي البسيط مقابل المضارع التام؛ الأزمنة السردية والأشكال المستقبلية). بالإضافة إلى ذلك، استكشف البحث آراء الطلاب حول هذه المواقع، بما في ذلك وجهات نظرهم حول دور المواقع التعليمية في تحسين إتقان قواعد اللغة الإنجليزية كلغة أجنبية، ودرجة مشاركتهم على المنصات، وحجم تأثير هذه المنصات على تعلم قواعد اللغة في المستقبل، ومدى رضاهم العام عن استخدام هذه المواقع لتعلم قواعد اللغة الإنجليزية كلغة أجنبية. كشفت نتائج الاختبار القبلي والبعدي عن تحسن كبير في الكفاءة النحوية لدى الطلاب، كما يتضح من الفرق الإيجابي بين درجات الاختبار القبلي والبعدي. علاوة على ذلك، أشارت بيانات الاستبيان إلى أن غالبية الطلاب ينظرون إلى مواقع الويب على أنها فعالة للغاية في تعزيز إتقانهم لقواعد اللغة، ووجدوا المنصات جذابة، وأعربوا عن رضاهم العام عن استخدامها. كما أفاد العديد من الطلاب أيضًا أن هذه المواقع أثرت بشكل إيجابي على نهجهم المستقبلي في تعلم القواعد.

الكلمات المفتاحية: البحث الإجرائي، المواقع التعليمية للغة الإنجليزية، المهارات النحوية.

I. Introduction

In today's globalized world, English proficiency is a crucial skill for professionals, particularly in technical fields such as engineering. Engineering students are required to effectively communicate complex ideas and technical information in English, both in written and spoken forms (Smith, 2020). However, many students at the intermediate level of English proficiency face challenges, especially in mastering grammar (Jones & Patel, 2019). This can negatively impact their ability to articulate ideas clearly, whether in academic contexts or future professional environments (Green & Brown, 2021).

For students at this level, traditional classroom-based grammar instruction may not fully meet their specific learning needs (Wilson, 2018). Consequently, there is a rising interest in utilizing digital resources, such as educational English language websites, which offer flexible and interactive learning experiences (Miller, 2022). These platforms provide customized grammar exercises, video tutorials, quizzes, and other tools designed for learners at different levels, enabling students to practice and enhance their language skills independently and at their own pace (Garcia, 2020). Digital resources have become increasingly appealing due to their accessibility, flexibility, and engaging nature. As technology continues to be integrated into education, resources like websites, apps, and multimedia allow students to access learning materials anytime and anywhere. These tools often feature interactive elements that boost student engagement and motivation. Moreover, digital resources promote personalized learning by adapting to various learning styles and allowing students to progress at their own speed. As a result, educators are turning to digital platforms as effective tools for improving language learning, fostering skill development, and promoting student autonomy.

Action research is a methodological approach designed to improve educational practices through iterative cycles of planning, acting, observing, and reflecting. Educators use this approach to address specific problems within their teaching environments, with the aim of enhancing their practices. The process is cyclical, allowing continuous refinement based on observations and reflections (Lewin, 1946). It is highly

contextualized, focusing on practical problem-solving in real-world settings (Kemmis & McTaggart, 1988). Collaboration among educators, students, and stakeholders is key, incorporating diverse perspectives for more effective solutions (Stringer, 2013). Reflective practice is central to action research, helping educators critically assess their interventions and make informed adjustments (Schön, 1983). Action research supports its effectiveness in improving teaching methods and promoting professional development (Elliot, 1991; Noffke & Somekh, 2009).

This action research aims to assess the impact of educational websites in enhancing the grammar skills of intermediate-level engineering students. Through the action research cycle—planning, implementing, observing, and reflecting—this study will evaluate the impact of these online resources on students' grammar proficiency. In addition, the research will investigate students' perceptions of using these websites, including their views on the effectiveness of improving grammar mastery, their level of engagement with the websites, the impact on their future grammar learning, and their overall satisfaction with using these platforms for learning grammar rules.

Problem Statement

It is evident that intermediate-level engineering students continue to face challenges in mastering English grammar due to using traditional teaching methods, which often fail to fully engage students or address their specific learning needs, particularly when it comes to grammar rules. On the other hand, here is a growing need to assess whether educational websites can effectively bridge these gaps and help students improve their grammar proficiency. Consequently, this action research aims to evaluate the impact of educational websites on the grammar skills of intermediate-level engineering students and to explore their perceptions of the effectiveness, engagement, and satisfaction associated with using these platforms for grammar learning.

Research Questions

1. How effective are educational English language websites in improving the grammar skills of intermediate-level engineering students?

2. How do engineering students perceive the effectiveness of educational English language websites in enhancing their grammar proficiency?

II. Literature Review

The Role of Grammar for Intermediate-Level English Language Learners

Grammar instruction is crucial for intermediate-level English language learners as it provides the foundation necessary for effective communication in both academic and professional contexts. At this level, learners have surpassed basic proficiency but still need significant support to refine their grammatical skills and enhance their language use in more complex situations (Richards, 2015). Mastery of grammar at this stage is essential for learners to produce coherent and accurate written texts, participate in discussions, and understand more advanced linguistic structures.

For intermediate learners, grammar instruction typically focuses on refining their understanding of more complex grammatical structures and their appropriate use in context. These structures include compound and complex sentences, passive voice, and modals, which are essential for producing clear and sophisticated language (Hedge, 2000). Effective grammar use enables learners to construct well-organized arguments, express nuanced ideas, and engage in detailed discussions, which are critical skills for academic success and professional communication (Schmitt, 2010).

Research indicates that intermediate learners benefit significantly from targeted grammar instruction that addresses their specific needs. For example, Bitchener and Knoch (2008) found that intermediate students who received focused feedback on their grammatical errors improved more quickly than those who received general feedback. This suggests that tailored grammar instruction can address common issues at the intermediate level, such as article use and verb tense consistency, leading to improved language proficiency.

Furthermore, grammar instruction at the intermediate level supports learners' overall language development by helping them develop a better understanding of language rules and their application. According to Ellis (2006), intermediate learners who engage in explicit

grammar instruction often show greater accuracy in language use and a deeper understanding of grammatical concepts. This, in turn, enhances their ability to produce language that is both correct and contextually appropriate.

In addition to improving grammatical accuracy, instruction that integrates grammar practice with communicative activities can be highly effective. Lightbown and Spada (2013) highlight that intermediate learners benefit from activities that not only focus on grammar rules but also provide opportunities to use these rules in meaningful communication. Such integrative approaches help bridge the gap between theoretical knowledge and practical application, facilitating more robust language use.

To sum it up, grammar instruction for intermediate English language learners is essential for advancing their language skills and supporting their academic and professional goals. By focusing on both accuracy and practical application, educators can help these learners achieve greater proficiency and confidence in their English language use.

Advantages of Using Online Educational Websites

Online educational resources have become an essential component in modern language learning due to their accessibility, flexibility, and the diverse range of tools they provide. These resources encompass interactive platforms, digital exercises, educational apps, and online courses, all of which are designed to enhance language skills. Numerous studies have demonstrated the effectiveness of these tools in improving language learning outcomes.

One of the primary advantages of online platforms is their ability to deliver "personalized learning experiences"along with "immediate feedback". According to Stockwell (2010), digital tools such as language learning apps and online exercises can offer learners tailored content that is aligned with their specific needs and proficiency levels. This customization facilitates more focused practice, which can lead to better outcomes compared to traditional learning methods (Godwin-Jones, 2014).

Research has shown that specific online tools, such as "interactive grammar exercises and quizze"s, can significantly improve learners' grammatical accuracy. For example, Peterson (2010) found that learners who engaged with online grammar exercises experienced notable improvements in their grammatical knowledge and application, outperforming those who relied on traditional paper-based exercises. The interactive nature of these resources fosters engagement and boosts learning efficiency.

In addition to language skills, "motivation and autonomy" are also enhanced through the use of online language learning platforms. As Reinders and White (2011) point out, these platforms often encourage learners to take part in "self-directed learning", which increases their motivation and promotes active participation in the learning process. The ability to access resources at any time and from anywhere contributes to a flexible, "learner-centered approach" to education (Cunningham & Friel, 2014).

The "flexibility and accessibility" of online educational websites make them particularly valuable, allowing learners to engage with educational materials at their convenience. This flexibility is especially beneficial for students with busy schedules or those who prefer self-paced learning, as it enables them to study on their own time (Bicen & Cavus, 2010).

Moreover, online platforms offer "engaging learning tools" that sustain students' interest through interactive activities like quizzes, videos, and games. These tools enhance the overall learning experience, making the process more enjoyable and motivating for students (Clark & Mayer, 2016). Another key advantage is the "immediate feedback" provided by many online platforms. Real-time assessments allow learners to monitor their understanding instantly and make necessary adjustments to their learning strategies (Wu et al., 2012).

Additionally, online platforms provide access to a "wide range of resources" including tutorials, videos, and articles. This wealth of content ensures that students with different learning styles can find materials that suit their individual preferences (Martinez, 2011). Lastly, online educational resources are often cost-effective, with many offering free or

affordable access to educational materials. This accessibility makes them an attractive option for learners who may not have the financial means to purchase traditional educational resources (Means et al., 2014).

In conclusion, the advantages of online educational websites are clear. They provide flexibility, engaging tools, immediate feedback, and a wide variety of resources that cater to diverse learning styles. Their cost-effectiveness further enhances their appeal, making them accessible to a broader range of learners. As technology continues to evolve, online educational platforms will likely become even more integral to the learning process, offering increasingly personalized and efficient ways to acquire knowledge and skills.

Disadvantages of Using Online Educational Websites

Despite the numerous advantages of online educational websites, there are several notable disadvantages that can hinder the learning experience. One key drawback is the "lack of personalized interaction". Although these platforms offer a vast range of resources, they often fall short in providing the same level of individualized attention and feedback that face-to-face learning environments offer. The absence of direct engagement with instructors can lead to a decline in student motivation and engagement, making it difficult for learners to stay connected and fully immersed in the learning process (Hrastinski, 2008).

Another common issue with online learning is the potential for "distraction". In a digital environment, students may find themselves tempted by non-educational websites or social media, which can lead to a significant reduction in focus and productivity. The convenience of multitasking online can make it challenging for learners to maintain their concentration on academic tasks, ultimately disrupting the learning process (Junco & Cotten, 2012).

Moreover, there is the concern of "over-reliance on technology". Students who depend heavily on online educational platforms are particularly vulnerable to technical issues or inconsistent internet access. These problems can disrupt their learning experience and impede their academic progress. Without reliable technology, students may face

barriers that prevent them from fully engaging with online resources (Jones et al., 2009).

While many online platforms offer "instant feedback", the quality of this feedback often lacks the depth and personalization provided by a human instructor. Automated responses may not adequately address students' specific needs or misconceptions, which can limit their ability to fully grasp concepts. As a result, the effectiveness of online platforms in fostering deeper learning can be compromised (Shute, 2008).

One of the most significant disadvantages of online educational websites is their reliance on a stable "internet connection". In regions with poor or unstable internet infrastructure, students often face interruptions or an inability to access materials, which can severely impact their academic progress. Learners in remote or underdeveloped areas may struggle to benefit fully from online resources due to these limitations (Aboagye et al., 2021). Furthermore, slow internet speeds and technical difficulties can lead to frustration, diminishing motivation and overall engagement with the content (Muilenburg & Berge, 2005).

In conclusion, while online educational websites provide flexibility, convenience, and a wealth of resources, they are not without their challenges. Issues such as the lack of personalized interaction, potential distractions, over-reliance on technology, limited feedback quality, and the need for a reliable internet connection can all impede the effectiveness of these platforms. To maximize the benefits of online learning, it is essential to address these challenges and find ways to integrate online tools with traditional teaching methods for a more balanced and effective educational experience.

Action Research in Education

Action research is a methodological approach aimed at improving educational practices through iterative cycles of planning, acting, observing, and reflecting. This approach is designed to address specific problems within educational settings and involves the active participation of educators who seek to enhance their teaching and learning processes. The principles of action research are grounded in its iterative and reflective nature, which distinguishes it from other research methodologies.

The foundational principle of action research is its cyclical process, which allows educators to continuously refine their practices based on empirical observations and reflections. According to Lewin (1946), the action research cycle involves identifying a problem, planning a strategy to address it, implementing the strategy, and then observing the results before reflecting and planning further actions. This iterative process helps educators to systematically test and improve their practices, leading to more effective teaching and learning.

One of the key principles of action research is its focus on practical problem-solving within specific educational contexts. According to Kemmis and McTaggart (1988), action research is highly contextualized, meaning that it is conducted in real-world settings with the aim of solving practical problems. This context-specific approach enables educators to address challenges that are directly relevant to their students and teaching environments, resulting in more targeted and effective interventions.

Another important aspect of action research is the collaborative nature of the process. Action research often involves collaboration among educators, students, and sometimes even other stakeholders such as parents or community members (Stringer, 2013). This collaborative approach ensures that multiple perspectives are considered, leading to more comprehensive and inclusive solutions to educational challenges. For instance, teachers may work together to implement and evaluate new teaching strategies, involving students in the feedback process to understand their experiences and needs better.

The reflective component of action research is also crucial. Reflective practice allows educators to critically evaluate the effectiveness of their interventions and make informed decisions about future actions (Schön, 1983). This ongoing reflection helps educators to identify what works well and what needs adjustment, fostering continuous improvement in teaching practices. Reflective practices are integral to the action research process, as they provide insights that guide subsequent cycles of planning and implementation.

Research on action research highlights its effectiveness in improving educational practices. For example, Elliot (1991) found that action research enables educators to engage in systematic inquiry that leads to meaningful changes in their teaching methods and student outcomes. Similarly, Noffke and Somekh (2009) emphasize that action research contributes to professional development by empowering educators to take ownership of their practices and become more reflective practitioners.

In summary, action research is a powerful tool for enhancing educational practices through its cyclical, collaborative, and reflective nature. By applying these principles, educators can systematically address specific problems, improve teaching and learning processes, and contribute to their professional growth.

III. Method

Research Design

This action research employed the four-stage cycle approach (planning, acting, observing, and reflecting) by (Lewin, 1946) to assess the impact of Educational English Language websites in improving grammar skills among engineering students at the intermediate level of English proficiency.

The four-stage cycle of planning, acting, observing, and reflecting is a foundational model in action research. In the planning stage, goals are identified and strategies are devised; in the acting stage, these plans are implemented. The observing phase involves collecting data on the outcomes, which is then followed by the reflecting stage, where insights are drawn and adjustments are made for the next cycle. This cyclical approach promotes ongoing learning and adaptation.

Participants

The researcher chose randomly 35 engineering students, aged between 18 and 19, at the intermediate level of English proficiency at MUST University, Egypt. It's worth noting that such students were enrolled in the summer semester 2024.

Intervention

The researcher conducted an online EFL course for second-year engineering students at the intermediate level via the Teams platform in

the summer semester 2024. Grammar instruction was a key component of the course, which was based on the "Speak Out" textbook. Each unit of the book included grammar rules related to the unit's theme; however, the explanations were often unclear and insufficient, and the exercises provided were too brief and inadequate for thorough practice. As a result, students struggled with the grammar portion of the course.

To address this, the researcher selected several educational English language websites (BBC Learning English, Perfect English, English Page, and Using English) to enhance the students' grammar proficiency. The focus was on specific grammar topics such as present simple vs. present continuous, past simple vs. present perfect, narrative tenses, and future forms, which were taught in units 1 through 4. In the first cycle, BBC Learning English and Perfect English were used. After evaluating the first cycle's results, the researcher revised the approach for the second cycle by incorporating two additional websites, Using English and English Page, to diversify the learning materials. Additionally, students were encouraged to use the Teams platform's chatbox for personalized feedback and participate in group discussions to further support their learning.

These websites were chosen because they matched the students' English proficiency level. Additionally, this selection provided a range of resources to cater to different learning styles, offering students a variety of options for practicing grammar rules.

The websites were first used to provide grammar explanations, after which the researcher shared links to exercises for students to complete as assignments for additional practice and formative assessment. For summative assessment, pre- and post-tests were also administered. This intervention spanned one month, with one session held each week.

BBC Learning English: (https://www.bbc.co.uk/learningenglish)

BBC Learning English is a comprehensive platform that offers a wide variety of English learning materials for different levels of learners. This platform covers grammar, vocabulary, pronunciation, and listening skills. It has dedicated sections for English grammar explanations and

practical exercises. Throughout grammar lessons, this website offers clear and concise grammar explanations along with examples in the form of articles, videos, and quizzes. It also includes short quizzes that accompany lessons, allowing students to check their understanding immediately. It's beneficial for all levels of English learners, but particularly useful for intermediate students who want a mix of video and practical grammar exercises.

Perfect English Grammar (https://www.perfect-english-grammar.com)

Perfect English Grammar is a website designed to help learners improve their grammar through clear explanations and practice exercises. It is very user-friendly and provides a range of practical resources to improve both basic and advanced grammar skills. This platform focuses on grammar rules and exercises. It offers clean and simple explanations, with plenty of practice exercises that are easy to follow. It offers detailed explanations and exercises on all English verb tenses, helping learners grasp this challenging area. It is useful for beginner to intermediate learners looking for straightforward grammar explanations and practice exercises. The site is ideal for focused practice on specific grammar points.

Using English: (https://www.usingenglish.com)

Using English is an extensive platform providing resources for both students and teachers of English. It has a comprehensive collection of grammar lessons, quizzes, articles, and discussion forums on various aspects of English grammar. The site primarily focuses on grammar explanations and teaching resources. It covers many aspects of grammar, from basic to advanced, with clear rules, examples, and usage notes. It provides a detailed grammar glossary that explains various terms and concepts related to English grammar. It includes a wide range of quizzes that test different grammar points, including verb tenses, conditionals, and parts of speech. Users can ask questions or participate in discussions about grammar and language usage, making it a good resource for peer learning. It provides teaching resources like Lesson plans, worksheets, and articles for educators to use in teaching grammar. Both students and

teachers looking for in-depth grammar explanations and practice. It is especially useful for intermediate to advanced learners.

English Page: (https://www.englishpage.com)

English Page is a straightforward and user-friendly website focused mainly on teaching English grammar through lessons, exercises, and interactive quizzes. It provides a comprehensive range of grammar topics suitable for intermediate to advanced learners. English Page emphasizes grammar practice, particularly in areas like verb tenses, modal verbs, and conditionals. It provides both theoretical explanations and interactive practice exercises. It includes extensive grammar tutorials covering essential topics such as verb tenses, modals, and prepositions. Each grammar lesson is followed by exercises that allow students to practice what they've learned with instant feedback. It offers Verb Tense Tutorials particularly strong focus on teaching verb tenses, offering detailed explanations and exercises. Intermediate to advanced learners who want to practice specific grammar rules in a structured, guided format.

Data Collection Instruments

1. Pre- and Post-tests

To evaluate the improvement in grammar skills, the researcher developed a grammar test consisting of 40 multiple-choice questions. The test focused on present simple vs. present continuous, past simple vs. present perfect, narrative tenses, and future forms.

Test Validity

To ensure the validity of the test, a panel of EFL experts reviewed it for face and content validity. They confirmed that the language used in the test was clear and appropriate for the students' English proficiency level.

Test Internal Consistency Reliability

To establish the reliability of the test, internal consistency was measured by examining the correlations between the sub-skills and the total test score. The test was administered to 20 students, and as shown in Table 1, the correlations between the sub-skills and the total score were

statistically significant at the 0.01 level, indicating that the test is internally consistent.

Table 1

Correlation between Sub-skills and Total Test Scores

Sub-skill	Total scores of Grammar Skills
Narrative Tenses	0.796
PastSimple Vs Present Perfect	0.810
Present Simple Vs Present Continuous	0.808
Future forms	0.789

Test-Retest Reliability

To determine the reliability of the pre-post test, the researcher administered the test to 20 students and re-administered it two weeks later. The correlation coefficient was calculated to be 0.825, as shown in Table 2, indicating that the pre-post test was reliable.

Table 2

Test-Retest Reliability results

Grammar Skill	Correlation coefficient
Narrative Tenses 0.806	
Past Simple Vs Present Perfect	0.787
Present Simple Vs Present Continuous	0.812
Future forms	0.805
Total scores of Grammar Skills	0.825

2. A Questionnaire

To evaluate students' attitudes toward using online educational websites, the researcher developed a questionnaire consisting of four dimensions, each containing four items. Students responded using a five-point Likert scale, ranging from strongly agree to strongly disagree, with a total possible score of 80. To ensure the scale's validity, a panel of EFL experts reviewed it and recommended simplifying certain items to match the students' English proficiency level. These recommendations were incorporated, and the final version is presented in Table 3.

Table 3

Questionnaire on Engineering Students' Attitudes toward Using Online English Websites

Dimensions & Items	Strongly Disagree 1	Disagree 2	Neutral (Neither agree or disagree) 3	Agre 4	Strongly Agree 5
1.Effectiveness of the Websites 1. Using English language websites has significantly improved my grammar skills. 2. I find that using English language websites has little to no impact on my grammar improvement. 3. The grammar exercises on these websites are effective in helping me understand complex rules. 4. The content provided on these websites does not contribute much to my understanding of grammar.					
2. Engagement with the Websites 1. I enjoy using English language websites to practice grammar. 2. I find it tedious to use websites for improving my grammar skills. 3. I often feel motivated to use these websites to enhance my grammar knowledge. 4. I rarely feel inclined to use these websites for grammar practice.					
3. Impact on Learning 1. I believe that using English language websites will have a long-term					

positive effect on my language skills. 2. I doubt that using these websites will have any lasting impact on my grammar abilities. 3. The websites provide a convenient way to practice grammar regularly. 4. I think the time spent on these websites could be better used elsewhere.					
4. User Satisfaction 1. I am satisfied with the overall experience of using English language websites for grammar practice. 2. I am often disappointed with the quality of the grammar exercises on these websites. 3. The websites' designs make grammar learning easier. 4. I find the navigation on these websites confusing, which hinders my learning.					

IV. Action Plan

To improve the EFL grammar skills of engineering students, the researcher employed four educational websites: BBC Learning English, Perfect English, English Page, and Using English. These resources focused on various grammar topics, including present simple vs. present continuous, past simple vs. present perfect, narrative tenses, and future forms. During the first cycle, the BBC Learning English and Perfect English websites were used and the grammar taught were present simple vs. present continuous and past simple vs. present perfect, while the second cycle included two more websites ,Using English and English Page. Each cycle lasted for two weeks. The whole intervention spanned one month during the summer semester, with sessions held once a week.

Initially, the websites were utilized for instructional purposes, after which the researcher provided links to exercises as assignments for additional practice after each session. Two quizzes were administered for assessment.

Data was collected before and after the intervention using a pre- and post-test to evaluate improvement. Additionally, an attitude scale was administered to gauge students' perceptions of the effectiveness of the online websites in enhancing their grammar proficiency.

V. Results

To address question 1—How effective are educational English language websites in improving the grammar skills of intermediate-level engineering students?—the researcher conducted two cycles of intervention.

Cycle I: In this initial phase, the researcher used the BBC Learning English and Perfect English platforms to teach "present simple vs. present continuous" and "past simple vs. present perfect." Statistical analysis of the pre- and post-test results from 35 participants demonstrated significant improvements. For "past simple vs. present perfect," the post-test mean score increased to 7.51 from the pre-test score of 6.40, with a t-value of 2.97 ($p = 0.00$). Similarly, for "present simple vs. present continuous," the post-test mean score rose to 7.34 from the pre-test score of 5.71, with a t-value of 3.43 ($p = 0.00$). The effect sizes for these improvements were medium, indicating moderate gains in grammar skills.

Cycle II: Reflecting on the feedback from Cycle I, where students reported challenges due to the lack of personalized feedback, the researcher introduced two additional websites—Using English and English Page—to diversify the learning materials. Additionally, the Teams platform's chatbox was utilized for personalized feedback, and students participated in group discussions. The results for Cycle II showed notable improvements: for "narrative tenses," the mean post-test score increased to 10.51 from 7.77, with a t-value of 4.59 ($p = 0.00$). For "future forms," the post-test mean score rose to 9.29 from 6.69, with a t-value of 4.96 ($p = 0.00$). The total scores for grammar skills also saw a

significant rise from 26.57 in the pre-test to 34.66 in the post-test, with a t-value of 5.17 (p = 0.00). The effect sizes for these improvements were large, indicating substantial gains in grammar proficiency.

 Overall, Cycle II showed more significant improvements compared to Cycle I, suggesting that the revised strategies based on Cycle I's feedback were effective in enhancing the students' grammar mastery.

To address question 2: How do engineering students perceive the effectiveness of educational English language websites in enhancing their grammar proficiency?

The researcher administered a questionnaire to understand students' perceptions of the effectiveness of websites in improving their grammar proficiency, and the results are as follows.

 The students' responses were analyzed, and the statistical outcomes are summarized in Table 4, which presents the mean scores, standard deviations, and t-values for different aspects of using websites to enhance grammar skills, along with their attitudes toward learning English grammar. Each aspect was evaluated on a scale with an assumed average of 12.

1. Effectiveness in Enhancing Grammar Skills had a mean score of 18.29, significantly higher than the assumed average (t = 25.354, p = 0.00), indicating that the websites were perceived as highly effective.
2. Engagement with the Websites showed a mean score of 18.40, with a t-value of 27.949 (p = 0.00), demonstrating strong student engagement.
3. Impact on Learning had a mean of 18.06, significantly above the assumed average (t = 23.986, p = 0.00), suggesting the websites had a positive effect on learning.
4. User Satisfaction recorded a mean score of 18.34, with a t-value of 30.376 (p = 0.00), indicating high satisfaction with the websites.

Moreover, students' attitudes toward using online English websites for improving grammar proficiency achieved a total score of 73.09, well above the assumed average of 48 (t = 28.488, p = 0.00), reflecting highly positive attitudes toward grammar learning through these websites. The significant t-values across all factors (p = 0.00) indicate strong positive effects in all areas evaluated.

Table 4

Results of The scale of attitudes toward learning English

The attitudes toward learning English grammar	N	Mean	Std. Deviation	Assumed average	t. value	Sig. Value
1.Effectiveness in Enhancing Grammar Skills	35	18.29	1.47	12	25.354	0.00
2.Engagement with the Websites	35	18.40	1.35	12	27.949	0.00
3.Impact on learning	35	18.06	1.49	12	23.986	0.00
4.User Satisfaction	35	18.34	1.24	12	30.376	0.00
Total Score	**35**	**73.09**	**5.21**	**48**	**28.488**	**0.00**

Table 5 provides the t-values, degrees of freedom, significance levels, and effect sizes for various factors related to using websites for improving grammar skills, all demonstrating large effects:

1. Effectiveness in Enhancing Grammar Skills has a t-value of 25.354 (d.f = 34) and a large effect size (d = 4.35), indicating a significant impact on grammar improvement.
2. Engagement with the Websites shows a t-value of 27.949 (d.f = 34) and a large effect size (d = 4.79), reflecting exceptionally high student engagement.
3. Impact on Learning has a t-value of 23.986 (d.f = 34) and a large effect size (d = 4.11), highlighting a notable positive effect on learning.
4. User Satisfaction presents a t-value of 30.376 (d.f = 34) and a large effect size (d = 5.21), underscoring high satisfaction levels.

Additionally, students' attitudes toward using online English language websites for learning grammar show a t-value of 28.488 (d.f = 34) and a large effect size (d = 4.89), indicating overwhelmingly positive attitudes toward these websites. All factors are significant at the 0.01 level, with large effect sizes across all areas, reflecting a strong impact on the assessed skills and attitudes.

Table 5

t- test results , $^2\eta$ and effect size results

The attitudes toward learning English grammar	t. value	d.f	Sig	$^2\eta$	d	Effect size
1.Effectiveness in Enhancing Grammar Skills	25.354	34	at (0.01)	0.95	4.35	Large
2.Engagement with the Websites	27.949	34	at (0.01)	0.96	4.79	Large
3.Impact on learning	23.986	34	at (0.01)	0.94	4.11	Large
4.User Satisfaction	30.376	34	at (0.01)	0.96	5.21	Large
Total Score	28.488	34	at (0.01)	0.96	4.89	Large

VI. Discussion

The research aimed to evaluate the effectiveness of educational English language websites in enhancing grammar skills among intermediate-level engineering students and to understand students' perceptions of these websites. Two cycles of intervention were conducted, each incorporating different strategies and resources to address students' grammar learning needs.

The first cycle utilized the BBC Learning English and Perfect English platforms to teach "present simple vs. present continuous" and "past simple vs. present perfect." The statistical analysis revealed significant improvements in both areas. For "past simple vs. present perfect," the mean score increased from 6.40 in the pre-test to 7.51 in the post-test, with a t-value of 2.97 (p = 0.00), indicating moderate improvement. Similarly, the mean score for "present simple vs. present continuous" rose from 5.71 to 7.34, with a t-value of 3.43 (p = 0.00), reflecting moderate gains. The effect sizes were medium for both areas, suggesting moderate effectiveness of the initial intervention.

Based on the feedback and results from Cycle I, the second cycle incorporated additional resources—Using English and English Page— and introduced personalized feedback through the Teams platform's chatbox and group discussions. This cycle aimed to address the lack of personalized feedback noted by students. The results showed substantial improvements: for "narrative tenses," the mean post-test score increased from 7.77 to 10.51, with a t-value of 4.59 (p = 0.00) and a large effect size of 0.80. For "future forms," the mean score rose from 6.69 to 9.29,

with a t-value of 4.96 and a large effect size of 0.85. The total scores for grammar skills demonstrated a significant increase from 26.57 to 34.66, with a t-value of 5.17 (p = 0.00) and a large effect size of 0.89. These results suggest that the revised strategies led to a substantial improvement in grammar proficiency.

To assess how engineering students perceived the effectiveness of the websites, a questionnaire was administered. The findings, summarized in Table 4, indicate that students perceived the websites as highly effective in enhancing their grammar skills, with a mean score of 18.29 (t = 25.354, p = 0.00). Engagement with the websites, impact on learning, and user satisfaction all received high scores, demonstrating strong positive attitudes. The total score of 73.09 (t = 28.488, p = 0.00) reflects overwhelmingly positive attitudes toward using these online resources for grammar learning.

Table 5 highlights that the effect sizes for all evaluated factors were large, indicating a significant impact of the websites on grammar skills and students' attitudes. The large effect sizes across all areas underscore the effectiveness of the online resources in enhancing grammar proficiency and student satisfaction.

The research concludes that educational English language websites are highly effective in improving grammar skills among intermediate-level engineering students. The second cycle's enhanced strategies, including diversified resources and personalized feedback, resulted in more substantial improvements compared to the first cycle. Furthermore, students' positive perceptions and the large effect sizes reinforce the value of these online platforms in supporting grammar learning.

VII. Conclusion and Recommendations

The findings from the research indicate that educational English language websites are effective in improving grammar skills among intermediate-level engineering students. The intervention across two cycles demonstrated significant improvements in grammar proficiency, with Cycle II showing superior results compared to Cycle I. Specifically, the introduction of additional resources and personalized feedback in Cycle II led to substantial gains in students' understanding of narrative

tenses, future forms, and overall grammar skills. The positive student perceptions and high effect sizes across all measured aspects further validate the effectiveness of these online platforms.

To ensure the effectiveness of online platforms in teaching English grammar and better assist students in reaching their language learning objectives the following recommendations are suggested.

1. Incorporate Personalized Feedback: The study highlights the importance of personalized feedback in enhancing learning outcomes. Websites should integrate features that allow for customized feedback, such as interactive chatboxes or personalized quizzes, to address individual learning needs and provide targeted support.
2. Diversify Learning Resources: To cater to different learning styles and preferences, it is beneficial to use a variety of educational resources. Incorporating multiple platforms, such as Using English and English Page, can offer diverse explanations and practice opportunities, which can enhance the overall learning experience.
3. Encourage Interactive Learning: Engaging students through interactive elements, such as group discussions and collaborative activities, can further support their learning. Platforms that facilitate peer interaction and discussion forums can help reinforce grammar concepts and promote active learning.
4. Regularly Update Content: Ensure that the online resources are regularly updated with current and relevant content to keep students engaged and provide them with up-to-date learning materials. This can also help in addressing emerging learning challenges and incorporating the latest teaching methodologies.
5. Monitor and Evaluate Effectiveness: Continuously assess the effectiveness of online platforms through feedback and performance data. This can help in identifying areas for improvement and making necessary adjustments to optimize the learning experience.

By implementing these recommendations, educators can enhance the effectiveness of online websites in teaching English grammar and better support students in achieving their language learning goals.

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