An Analysis of the Implementation Duolingo Application in Teaching English Skills in Eleventh Grade at SMA Negeri 1 Tasifeto Timur

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Abstract. This study examines the implementation of the Duolingo application in teaching English skills to eleventh-grade students at SMA Negeri 1 Tasifeto Timur. With the increasing integration of technology in education, this research aims to evaluate the effectiveness of Duolingo as a tool for enhancing language acquisition and engagementt among learners. Through a mixed-methods approach, the study analyzes student performance, engagement levels, and overall satisfaction with the application compared to traditional teaching methods. The results indicate a significant improvement in vocabulary retention, grammatical proficiency, and conversational skills among students utilizing Duolingo. Additionally, qualitative feedback highlights the app's user-friendly interface and gamified learning experience as motivating factors.

Keywords: AI, Duolingo, English Learning, Gamification, Media Learning

1. BACKGROUND

Learning a foreign language (English) through Duolingo, provides a different experience. Every learning system must have elaborated some aspect of the methodology, which guarantees leaning success. The aspects are facing progress, motivation, feedback and vocabulary (Rifdinal,2022).Richard and Schmidt (2010:206) cited in (Panti, Al, Di, & Ngajum, 2019) foreign language is " A language which is not the Native Language of large number of people in a particular country or region, is not used as a medium of instruction in school, and is not widely used a medium of communication in government, media, etc. Foreign language are now widely used for learning materials both for reading, or communicating among people. English is a foreign language that is considered important for the community because of it's widespread use and is certainly used if you want to apply for a job. English also has a strategic place, in addition to communication it can also relate between nations.

Technology platforms offers a distinct approach to education needs of learners worldwide is Duolingo. The one of the most popular language learning apps is Duolingo. Duolingo is a language learning tool available as an app. The concept was originally developed by Professor Luis Von Ahn and his graduate student Severin Hacker at Carnegie Mellon University. The goal is to provide high-quality education and make it accessible to everyone. When the private beta version was launched, there were 300,000 people on the waiting list. The app officially launched on June 19, 2012, and has since attracted a growing number of users. Duolingo presents its material in a gamified format. Users encounter

concepts commonly found in video games, such as levels and experience points (XP). The difficulty of each lesson is represented as a level, while XP is required to advance through the lessons.

The purpose of this study is to evaluate the impact of using media technology, in this case Dualingo and then analysis the data using statictical analysis where the writer use pre-test, treatment and post-test. In the context of research design, the writer has opted to adopt a quantitative methodology. This approach is characterized by its emphasis on the manipulation and analysis of numerical data, which is systematically treated using statistical techniques. As articulated by Sugiyono (2013), quantitative research represents a methodological paradigm that predominantly employs data expressed in numerical formats, facilitating rigorous statistical analysis aimed at uncovering patterns, relationships, and causal inferences.

To operationalize this quantitative framework, the writer has implemented a structured research process that consists of three distinct phases: the pre-test, the treatment phase, and the post-test. The pre-test serves as a preliminary assessment, allowing for the collection of baseline data prior to the implementation of any interventions or treatments. Subsequently, during the treatment phase, the researcher applies a specific intervention or variable that is intended to influence the outcomes of interest. Finally, the post-test is conducted to evaluate the effects of the treatment, providing a comparative analysis with the pre-test results.This sequential design not only allows for a comprehensive examination of the impact of the intervention but also enhances the reliability of the findings through the use of controlled testing conditions. By engaging in this systematic approach, the writer underscores the importance of employing quantitative methods to derive objective conclusions that are grounded in empirical evidence.

2. THEORITICAL BACKGROUND

Theoretical Support for Integrating Digital Tools like Duolingo into Language Learning

Integrating digital tools like Duolingo into language learning is supported by various educational theories that emphasize active engagement, social interaction, and personalized learning. Here are key of the effectiveness of such tools:

a. Constructivist Theory

Constructivism, particularly as articulated by Vygotsky (1998), posits that learners construct knowledge through interactions with their environment and social contexts.

Digital tools like Duolingo promote active engagement through interactive exercises that require learners to practice language skills in meaningful contexts. This aligns with Vygotsky's concept of the Zone of Proximal Development (ZPD), where learners are challenged just beyond their current capabilities with appropriate support, facilitating growth and understanding.

b. Social Learning Theory

Bandura's Social Learning Theory emphasizes the importance of observation and modeling in learning. Digital platforms often incorporate social features that allow learners to interact with peers, share resources, and engage in collaborative tasks. This social aspect enhances motivation and provides opportunities for learners to observe and mimic language use in authentic contexts, which is crucial for language acquisition.

c. Cognitive Load Theory

Cognitive Load Theory suggests that learning is more effective when information is presented in a way that minimizes extraneous cognitive load. Digital tools can provide multimedia resources—such as videos, audio clips, and interactive exercises—that help break down complex language concepts into manageable chunks. This approach supports better retention and understanding by aligning with how learners process information.

d. Task-Based Language Teaching (TBLT)

TBLT focuses on using meaningful tasks as the central component of language learning. Digital tools like Duolingo offer task-based exercises that require learners to apply their language skills in practical scenarios, enhancing their ability to use the language in real-life situations. This method promotes active learning and helps students develop communicative competence.

e. Theories of Motivation

The integration of gamification elements in digital tools taps into motivational theories by making learning engaging and rewarding. Features such as points, badges, and leaderboards encourage students to participate actively and persist in their language learning efforts. This aligns with Self-Determination Theory, which emphasizes the role of intrinsic motivation in fostering engagement and persistence5. Nurturing Engagement: In the evolving landscape of education, technology has the potential to elevate learning experiences, but it also presents significant distractions. Educators face the ongoing challenge of captivating students' attention amidst the overwhelming array of online stimuli that vie for their focus. Striking a balance between leveraging the benefits of

technological tools and minimizing their disruptive influences requires creativity and strategy.

By acknowledging the dual nature of technology's impact—both its transformative contributions and its potential pitfalls—educators can more adeptly harness its power to enrich the learning journey for ESL students. This approach not only enhances language proficiency but also cultivates a deeper sense of confidence in their abilities, empowering them to navigate their linguistic challenges with greater assurance.

f.   Gamification In Education

Gamification in education refers to the integration of game design elements, mechanics, and dynamics into learning environments to enhance student engagement, motivation, and overall learning outcomes. Key features of gamification include incorporating game elements such as rewards (points and badges), leaderboards, progress tracking, challenges, and levels, which create an interactive and enjoyable learning experience. The approach also provides immediate feedback, allowing students to receive real-time insights into their progress, and helping them identify their strengths and areas for improvement. Furthermore, gamification facilitates personalization through adaptive technologies that create tailored learning experiences matching individual learning styles and paces. According to Mystakidis (2023) gamification in education has significant perspectives in learners, the allure of gamification is influenced learning to be more engaging. Social interaction is another vital aspect, as multiplayer features, group challenges, and peer-to-peer competitions foster teamwork and social skills. The benefits of gamification are manifold; it increases engagement by making learning enjoyable and immersive, boosts motivation through reward systems, and enhances knowledge retention compared to traditional methods. It also promotes skill development in areas like critical thinking, problem-solving, collaboration, and creativity, while structured progression helps students effectively achieve their educational goals and reduces feelings of frustration. Popular examples of gamification tools include Kahoot, which offers quizzes to assess understanding in a competitive format, Minecraft Education Edition, allowing students to build virtual worlds while applying subject knowledge creatively, and the Civilization Game Series, which teaches history through strategic gameplay. However, there are challenges associated with this approach, such as the fact that not all students may respond equally well to gamified methods and that an overemphasis on competition could demotivate some learners. Therefore, it requires thoughtful implementation to ensure

alignment with educational objectives rather than just prioritizing entertainment. In conclusion, when implemented thoughtfully, gamification has the potential to transform education by making it more engaging, personalized, and effective, enhancing academic performance while simultaneously fostering holistic growth and essential life skills like teamwork and resilience. Gamification in education refers to integrating game design elements, mechanics, and dynamics into learning environments to enhance student engagement, motivation, and overall learning outcomes. Gamification in education creates various game elements to create an interactive and enjoyable learning experience. This includes incorporating rewards such as points and badges, as well as leader boards, progress tracking, challenges, and levels. One of the key features is the provision of immediate feedback, which allows students to receive real-time insights into their progress, helping them identify their strengths and areas needing improvement. Furthermore, adaptive technologies personalize learning experiences to match individual styles and paces, enhancing engagement. Additionally, gamification fosters social interaction through multiplayer features, group challenges, and peer-to-peer competitions, promoting teamwork and the development of social skills among students. rewards (points, badges), leader boards, progress tracking, challenges, and levels to create an interactive and fun learning experience. In other word Gamification has the potential to transform education by making it more engaging, personalized, and effective. When implemented thoughtfully, it not only enhances academic performance but also fosters holistic growth by developing essential life skills like teamwork and resilience.

3. RESEARCH DESIGN

In the section, the writer choosing Quantitative method as a research design, qualitative is research method that analysis data through number and statistic. According to Sugiyono (2013) quantitative is a research approach that uses data in the form of numbers and analysis using statistics. The writer use pre-test, treatment and post test. This study take a place at SMA Negeri 1 Tasifeto Timur, in eleventh grade. The reason the writer choose this place because the lack of technology implementation never been use.

Collecting Data

Technique of collecting data in this study is through experiment, where the writer using 1) pre-test for students to evaluate and determine the baseline scores, by collecting this baseline scores the writer can ensure that any subsequent changes can be effectively attribute to the treatment. 2) treatment to determine the effect of the outcomes of the students in this case the writer using media technology Duolingo and last one is post-test to measure the changes after the treatment.

Pre-Test

In quantitative research, a pre-test refers to a preliminary assessment conduct before the treatment pre-test is a systematic assessment carried out prior to the implementation of an intervention or treatment. Its primary purpose is to gather initial data, establishing a baseline measurement that can be used for comparative analysis later on. By evaluating participants' conditions, skills, or knowledge before any changes occur, the pre-test provides valuable insights that help gauge the effectiveness of the subsequent intervention. This foundational step is crucial for ensuring accurate evaluations of progress and outcomes.

Post-Test

Post-test is a critical assessment conducted following an intervention, treatment, or program, aimed at evaluating the impact it has had on participants. This evaluation is an integral part of a pre-test-post-test research design, which employs the same measurement tool to gauge participants' knowledge, skills, or attitudes both before (pre-test) and after (post-test) the intervention. By comparing the results from these two assessments, researchers can effectively measure changes in the dependent variable, providing valuable insights into the effectiveness of the intervention and its influence on the participants involved. post-test in quantitative research is an assessment conducted after participants have undergone a treatment or intervention. It serves to measure the effects of that treatment

Treatment

In quantitative research, treatment refers to the specific intervention or condition applied to participants in an experimental study. In quantitative research, the term "treatment" denotes the particular intervention, procedure, or condition that researchers deliberately apply to participants within an experimental study. The treatment is a crucial component of the study design, as it is used to determine its effects on the participants' outcomes. The treatment of this study is using Duolingo to determine the students outcomes after the pre-test.

Method of Data Analysis

Method of analyzing data in this research is involves using statistical methods of analysis. Where the writer collect data using pre-test, treatment and post-test and then analyzing the data through paired t-test. Paired t-test is a powerful statistical technique employed to evaluate the means of two related groups, particularly in scenarios where measurements are taken on the same subjects under different conditions or at two distinct time points. This method is particularly useful in "before-and-after" studies, where researchers aim to assess the effect of an intervention by comparing pre-treatment and post-treatment outcomes. By analyzing the differences between the paired observations, the paired t-test helps determine whether any observed variations are statistically significant, providing valuable insights into the impact of the factors being studied. Here is data formula of paired t-test:

$$t = \frac{\bar{d}}{s_d / \sqrt{n}}$$

Where $\bar{d}$ = mean of pre and post test score

Where s_d = standard deviation in differences

Where n = sample size

4. FINDING AND DICSUSSION

Paired t-test

Table 1. Paired t-test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	PRE TEST	50.94	32	15.525	2.744
	POST TEST	82.50	32	9.504	1.680

In the first table 1 the show the result of Paired sample statistic it show descriptive statistic of the pre-test and post-test data, which include mean, students sample, standard deviation and standard error mean.

Table 2. Paired Samples Correlations

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 PRE TEST & POST TEST	32	.793	.000

The second table 2 is the show the correlation of pre-test and post-test. If the significant of paired t-test is <0,05 then it means that there is significant correlation of pre-test and post-test. Based on the result in the table is show the significant of the data is 0,00 therefore, the data result in this study is show the significant correlation between pre-test and post-test

Table 3. Paired Samples Test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRE TEST - POST TEST	-31.563	9.873	1.745	-35.122	-28.003	-18.084	31	.000

In paired t-test, there are term and condition that have to be follow score to understand the improvement of the significant 2-tailed. Significant 2 tailed in paired t-test is used to determine significant differences between two means of pre and post test, therefore if the significant score less than 0,05 (<0,05) is significant improvement in students and if the significant score is greater than 0,05 (>0,05) it mean there is no significant improvement in students. Based on data result in the table 4.1.3 the significant score 2-tailed is 0,00. So, if we compare to the term of 2-tailed the result of the data is show the significant improvement of students.

Discussions

In this section the writer will describe more about the result of the data of pre test before the treatment in finding. The writer used paired t-test to analyze data from student

score pre -test before treatment and post -test after treatment and the treatment that the writer used is media learning Duolingo.

However, before the writer explain about the result data of significant different between two variable (pre-test and post test) the writer will explain about the basic decision rules of Paired T-test which is if the significant score is less than 0,05 Then there is significant improvement between the two variable but if the significant score is greater than 0,05 then there is no significant improvement between the variable. based on the data The p-value indicating the difference in English skills before and after utilizing Duolingo is reported to be less than 0.05, This result signifies a statistically significant improvement in students English capabilities. Because low p-value provides compelling evidence to reject the null hypothesis, reinforcing the assertion that Duolingo has had a substantial and measurable positive impact on enhancing English language skills. The findings suggest that the app effectively aids learners in developing their proficiency in English, especially students in eleventh grade SMAN 1 Tasifeto Timur.

5. CONCLUSION

The data indicates a statistically significant improvement in English skills among students after utilizing the Duolingo application. With a p-value of less than 0.05,it strongly suggests that the observed enhancement in students' English capabilities is not due to random chance. This finding effectively rejects the null hypothesis and reinforces the notion that the intervention applied—specifically, the use of Duolingo—has had a substantial positive effect on learners. The results highlight the effectiveness of the app in supporting students at SMAN 1 Tasifeto Timur in their journey to develop greater proficiency in English. Overall, this study underscores the potential of using technology as a valuable resource in educational settings to enhance language learning outcomes.

6. SUGGESTION

Based on the data indicating a significant improvement in English skills among students using the Duolingo application, several suggestions can be made:

a. Integrate Technology in Curriculum: Schools could consider incorporating language learning apps like Duolingo into their English curriculum to enhance student engagement and proficiency.

b. Training for Educators: Provide training for teachers on how to effectively integrate these applications into their teaching methods, ensuring they can guide students in using the technology to its full potential.

c. Encourage Consistent Use: Encourage students to use Duolingo regularly outside of the classroom. Consistency can reinforce learning and help students build vocabulary and grammar skills more effectively.

d. Monitor Progress: Set up a system to monitor students' progress with the application over time. This can help in tailoring interventions for those who may need additional support.

e. Supplementary Resources: Consider using Duolingo as a supplementary resource alongside traditional teaching methods to cater to diverse learning styles and preferences.

f. Explore Other Applications: Investigate and evaluate other language learning technologies and applications to determine if there are additional tools that can further enhance English skills among students.

g. Student Feedback: Conduct surveys or feedback sessions to understand students' experiences and gather suggestions for improving the use of the app in their language learning.

By implementing these suggestions, educational institutions can maximize the benefits of technology like Duolingo to further enhance language learning outcomes.

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