

# EXAMINING THE RELATIONSHIP BETWEEN AI-BASED LANGUAGE LEARNING ENGAGEMENT AND GRAMMAR ACHIEVEMENT: EVIDENCE FROM DUOLINGO USE

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## Abstrak

Saat ini, penggunaan aplikasi pembelajaran bahasa berbasis kecerdasan buatan semakin meningkat dari waktu ke waktu, dimana para siswa bisa belajar bahasa kapan pun dan di mana pun dengan mudah. Fenomena ini menimbulkan beberapa persoalan yang berkaitan dengan durasi penggunaannya dengan kompetensi grammar dari para siswa. Oleh karena itu, penelitian ini bertujuan untuk menelusuri dan menguji hubungan antara durasi penggunaan an aplikasi pembelajaran bahasa berbasis AI, yaitu Duolingo, dengan pencapaian grammar mereka. Penelitian ini dilaksanakan menggunakan desain penelitian kuantitatif korelasional. Data dikumpulkan dari 30 mahasiswa Tadris Bahasa Inggris di Universitas Islam Negeri Madura melalui Google Forms dengan beberapa kuisisioner, berkaitan dengan durasi penggunaan Duolingo dan nilai ujian akhir grammar mereka. Data dianalisis menggunakan IBM SPSS Statistics, mulai dari analisis deskriptif, tes normalitas, dan analisis korelasi Spearman's rank-order. Hasil dari analisis korelasi menunjukkan koefisien korelasi ( $\rho$ ) 0.061 sementara nilai signifikansinya (p-value) 0.749, dengan tingkat signifikansi yang ditetapkan pada alpha ( $\alpha$ ) 0.05. Hasil tersebut menunjukkan sebuah hubungan yang sangat lemah dan tidak signifikan secara statistik antara durasi penggunaan Duolingo dengan pencapaian grammar. Adapun selain itu, temuan ini juga menunjukkan bahwa durasi belajar di Duolingo saja mungkin tidak begitu kuat berkaitan dengan kemampuan grammar mahasiswa. Selaras dengan temuan ini, penulis juga ingin menekankan pentingnya kualitas belajar dibanding dengan durasi penggunaan Duolingo itu saja.

**Kata Kunci:** Pembelajaran Bahasa Berbasis AI, Waktu Layar Duolingo, Capaian Grammar, Pembelajaran Bahasa Inggris.

## Abstract

Nowadays, the usage of AI-based language learning applications has been increasing over time, where students are able to learn any languages easily anytime and anywhere. This such phenomenon raised some questions related to its usage duration (screen time) alongside the learners' grammatical competence. Therefore, this research aimed to explore and examine the relationship between students' screen time of an AI-based language learning app, namely Duolingo, and their grammar achievement. This research was conducted using a quantitative, correlational design. The data were analyzed on IBM SPSS Statistics, including descriptive analysis, normality test, and Spearman rank-order correlation. The correlation coefficient ( $\rho$ ) at 0.061 and the p-value at 0.749, with the set of significance level at alpha ( $\alpha$ ) 0.05. Those results revealed an extremely weak and not statistically significant relationship between Duolingo screen time and grammar achievement. Furthermore, these findings suggest that the duration of learning on Duolingo alone may not be strongly enough associated with their grammar competence. Alongside these findings, the authors would like to emphasize the importance of learning quality over the duration of usage itself.

**Key Words:** AI-Based Language Learning, Duolingo, Screen Time, Grammar Achievement, ELT

## INTRODUCTION

Artificial Intelligence (AI) has developed and used rapidly over time. This invention helps humans in such many fields, especially in education context, where this helps teachers and students in their teaching learning process. As mentioned in the previous research by Ibrahim Mohamed and Al-Jadaan in 2024, AI-based language learning applications also known as Mobile Assisted Language Learning (MALL) have become widely popular, especially for English language learning.<sup>1</sup> Among these AI-based language learning apps, there is a popular language learning apps called Duolingo, where students can learn language especially English with such an interactive and user-friendly interface. This application helps students learn English beyond their classroom settings.

Duolingo is widely known as a friendly app for language learning, especially for English language learning. It is designed to make students learn any language in a fun and interactive way. The amount of exposure or duration is one of the key factors that supports language acquisition. According to Stephen Krashen, he proposed that language acquisition happened when learners consistently receive and adapt to the language input.<sup>2</sup> In this modern era, the exposure or duration, especially related to smartphone or monitor screens, people nowadays, commonly called it as screen time. Furthermore, the screen time can be an indicator of learners' exposure to the language they are learning. Moreover, this highlights that not only the availability of input but also the continuity of screen time also plays a part in language acquisition, particularly in grammar competence.

In English learning process, grammar is being one of the sub-skills of English proficiencies. Some of the previous studies suggest that Duolingo has its own effectiveness helps improving the students' grammar and vocabulary mastery. Despite its effectiveness, the discussion between Duolingo screen time and grammar remains limited. Thus, this study aims to examine the relationship between Duolingo screen time and students' grammar achievement using a quantitative correlational approach. Focusing on usage duration (screen time) and grammar performance in the classroom, this study attempts to provide empirical evidence whether screen time of learning on Duolingo is associated with learners' grammar achievement or not.

Extensive research has already examined and studied the use of an English learning application, namely Duolingo, across various educational institutions. Including junior high school, senior high school, university level, and course institution.<sup>3</sup> Most of the

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<sup>1</sup> Omnia Ibrahim Mohamed and Omar Al-Jadaan, "Online and Mobile-Assisted Language Learning," in *Level Up! Exploring Gamification's Impact on Research and Innovation*, ed. Tibor Guzsvinecz (IntechOpen, 2024), <https://doi.org/10.5772/intechopen.1003054>.

<sup>2</sup> Stephen D. Krashen, *Principles and Practice in Second Language Acquisition*, 8. ed, Language Teaching Methodology Series (New York: Phoenix ELT, 1995), 16.

<sup>3</sup> Husnur Rosyidah Aulia, Eka Wahjuningsih, and Rika Andayani, "EFFECT OF DUOLINGO APPLICATION ON STUDENTS' ENGLISH VOCABULARY MASTERY," *ELTR Journal* 4, no. 2 (July 2020): 131–39, <https://doi.org/10.37147/eltr.v4i2.71>; Redyta Zalfa Maharani, Putu Dian Danayanti Degeng, and Khairil Azwar Razali, "The Use of Mobile Assisted Language Learning To Improve English Grammar for Senior High School Students," *Journal of Languages and Language Teaching* 12, no. 3 (July 2024): 1455, <https://doi.org/10.33394/joltt.v12i3.11041>; La Ode Achmad Suherman et al., "Leveraging MALL in Higher Education: A Study on Duolingo's Efficacy in Enhancing Language Learning Motivation," *Elsya : Journal of English Language Studies* 6, no. 3 (October 2024): 231–43, <https://doi.org/10.31849/elsya.v6i3.22843>; Syandi Mei Fanni and Mega Mulianing Maharani, "Students' Perceptions Regarding the Use of Duolingo to Enhance Grammar Learning," *Indonesian Journal of Education and Pedagogy* 1, no. 3 (December 2024): 185–93, <https://doi.org/10.61251/ijoe.v1i3.98>.

research examined the use of Duolingo as a beneficial tool to support the English teaching and learning process.<sup>4</sup>

Previous studies that employed quantitative research designs, mostly employed quasi-experimental approaches were especially used to investigate the effectiveness of Duolingo by comparing students' language performance, which are grammar and vocabulary mastery, before and after treatment or between experimental and control groups.<sup>5</sup> In addition, several studies employed descriptive quantitative methods to examine students' perceptions, attitudes, and responses toward the use of Duolingo.<sup>6</sup> These methodological tendencies indicate that prior research has emphasized outcome measurement and effectiveness evaluation, whereas exploring detailed individual learning processes on Duolingo and the relationship between Duolingo and grammar achievement is still considered limited.

Aligned with those methodology, some of the previous studies aimed to evaluate the effectiveness of Duolingo as an English language learning app, investigate its impact on students' English language achievement, and explore learners' perceptions of AI-based language learning. Which is specifically focused on language sub-skills such as grammar and vocabulary, reporting improvements after the implementation of Duolingo. Overall, the purposes of these previous studies suggest a strong focus on determining whether Duolingo can function as an effective learning tool in English as a Foreign Language (EFL) and in English Language Teaching (ELT) process.

In addition, many positive results were acknowledged related to the usage of Duolingo. Learners who engaged with this language learning app mostly demonstrated some improvement in their English skills such as in their grammar and vocabulary. Moreover, many users tended to express positive feedbacks toward Duolingo as a language learning platform.<sup>7</sup> These findings suggest that Duolingo has its own potential advantages for supporting English language learning process, mainly as a complementary mobile-learning tool that encourages practice and learner engagement.<sup>8</sup>

Several important gaps in existing research must be acknowledged. First, most previous research tends to skip measuring Duolingo engagement in terms of screen time. Stephen Krashen in his book *Principles and Practice in Second Language Acquisition* explains that exposures is one of factors when acquire a certain language.<sup>9</sup> In this research

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<sup>4</sup> Lisa Irwit Santi, Achmad Hilal, and Rismiyanto -, "Review of Duolingo Application in Learning English," *Channing: Journal of English Language Education and Literature* 8, no. 2 (October 2023): 56–63, <https://doi.org/10.30599/channing.v8i2.2079>.

<sup>5</sup> Lusi Purnama Sari, Tommy Hastomo, and Eva Nurchurifiani, "ASSESSING THE EFFICACY OF DUOLINGO FOR ACQUIRING ENGLISH VOCABULARY SKILLS: EXPERIMENTAL RESEARCH," *Journal of English Teaching, Applied Linguistics and Literatures (JETALL)* 6, no. 2 (October 2023): 193, <https://doi.org/10.20527/jetall.v6i2.17145>.

<sup>6</sup> Fanni and Maharani, "Students' Perceptions Regarding the Use of Duolingo to Enhance Grammar Learning."

<sup>7</sup> Zaharah Linal Hawa and Roslaine Roslaine, "STUDENTS' PERCEPTION TOWARD USING DUOLINGO FOR LEARNING ENGLISH," *KLASIKAL : JOURNAL OF EDUCATION, LANGUAGE TEACHING AND SCIENCE* 6, no. 3 (December 2024): 604–11, <https://doi.org/10.52208/klasikal.v6i3.1213>.

<sup>8</sup> Syarifah Aini, Afifah Raihany, and Fithriyah Rahmawati, "Improving a Skills of EFL Students Using Duolingo in a Rural Madurese School," *Social, Humanities, and Educational Studies (SHES): Conference Series* 8, no. 3 (July 2025): 1973–78, <https://doi.org/10.20961/shes.v8i3.107467>.

<sup>9</sup> Krashen, *Principles and Practice in Second Language Acquisition*, 16.

the screen time acts as the exposure of each student. Beyond this, the next gap is, learning outcomes were generally assessed through group-based comparisons, and studies on exploring and assessing individual learning behaviors and achievement remains limited. And lastly, the previous studies tend to rely on learners' perceptions instead of objective performance measurements. Where Aileen Edele et al., and Hernández-Rivera et al., argue that self-assessment and perceptions may not be accurate enough to capture the actual language competence.<sup>10</sup> For these reasons, studies that examine and explore the individual relationship between Duolingo screen time and grammar competence, especially with EFL learners, are limited. Addressing this gap, it is necessary to conduct research on how the intensity of Duolingo screen time relates to students' grammar achievement.

## METHOD

This research employed a quantitative, correlational research design. A quantitative approach is suited for this research, as it investigates to measure and find out the strength of the relationship between Duolingo screen time and students' grammar achievement using numerical data.<sup>11</sup> As stated by Creswell and Creswell, quantitative methods are particularly suitable when the research objective involves hypotheses, examining variable relationships, and estimating effect sizes through statistical analysis and interpretation.<sup>12</sup>

The participants of this research were 30 undergraduate students of an English Education Program, exactly in the 3rd semester from two classes at the State Islamic University of Madura (*Universitas Islam Negeri Madura*). Convenience sampling was used, as the participants were selected based on their availability and willingness to participate in the study.<sup>13</sup> And all the participants had prior experience using Duolingo application. The authors gathered the data through an online survey via Google Forms. Before the participants filling out the form, we informed them the purpose of the study and asked for their consent for the data collection and analysis. And also, we make sure that all collected responses were kept safe, anonymous, and confidential.<sup>14</sup>

This study employed questionnaires consisted of three main instruments. First, participants were asked about their average Duolingo usage in minutes. Then, they were asked how frequently they use Duolingo each day. For the participants who reported using Duolingo twice or more per day, we calculated and multiplied their average duration by the frequency of learning on Duolingo as the amount of their daily usage. And for the last one, participants were asked to report their grammar scores, which were obtained from their final exams.

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<sup>10</sup>Aileen Edele et al., "Why Bother with Testing? The Validity of Immigrants' Self-Assessed Language Proficiency," *Social Science Research* 52 (July 2015): 99–123, <https://doi.org/10.1016/j.ssresearch.2014.12.017>.

<sup>11</sup>Louis Cohen, Lawrence Manion, and Keith Morrison, *Research Methods in Education*, 8th ed (London New York: Routledge, 2018).

<sup>12</sup>John W. Creswell and J. David Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th ed (Los Angeles London New Delhi Singapore Washington DC Melbourne: SAGE, 2018).

<sup>13</sup>H. Russell Bernard, *Research Methods in Anthropology: Qualitative and Quantitative Methods*, 3th ed (Walnut Creek, CA: AltaMira Press, 2002).

<sup>14</sup>British Educational Research Association, *Ethical Guidelines for Educational Research*, Ethical guidelines, 4th ed. (London, UK: British Educational Research Association, 2018), [https://study.sagepub.com/sites/default/files/bera\\_ethical\\_guidelines\\_2018\\_4th\\_ed.pdf](https://study.sagepub.com/sites/default/files/bera_ethical_guidelines_2018_4th_ed.pdf).

After data collection, the collected data were analyzed using a statistical computer software called IBM SPSS Statistics, with the set of significance level at alpha ( $\alpha$ ) 0.05. Firstly, an analysis of descriptive statistics was run to summarize the mean, standard deviation, minimum and maximum values, kurtosis, and skewness of Duolingo screen time and grammar scores. As mentioned by Field, a descriptive analysis is essential to provide an overview or summary for participants' data right before running the inferential and main analysis.<sup>15</sup>

Before the correlation was analyzed, a normality test was run using Shapiro-Wilk test, as it is recommended for small sample sizes ( $N < 50$ ).<sup>16</sup> This normality test is used to consider which correlation analysis is suitable for this data whether it is a parametric or non-parametric analysis. The results indicated that the Duolingo screen time data did not meet the assumption of normal distribution. Thus, a non-parametric correlation analysis was considered more appropriate and suitable.<sup>17</sup>

Since the data were not normally distributed, Spearman's rank-order correlation (Spearman's rho) was run to analyze the relationship between Duolingo screen time and grammar achievement. Spearman's rho is appropriate for examining the correlations when data are ordinal or not normally distributed.<sup>18</sup> The correlation coefficient and significance value were interpreted to determine whether a statistically significant relationship existed between both variables.

## RESULTS AND DISCUSSION

### Results

The descriptive statistics of Duolingo screen time and grammar scores are presented in Table 1. The average Duolingo screen time among 30 students is 9.83 minutes out of the maximum recorded duration of 20 minutes. And for the standard deviation (SD) the result is 4.450, which indicates a moderate variability, and reveals that most of students' learning duration on Duolingo is not extremely far from the mean. In contrast, the mean or average of grammar scores is 70.17, with a larger SD 14.350. Those means and standard deviation results show that students' grammar achievements vary widely, with several students scoring quite distance above and below the average of the grammar scores.

**Table 1.** Descriptive Statistics of Duolingo Screen Time (Minutes) and Grammar Scores

Variable	N	Mean	SD	Skewness	Kurtosis
Duolingo screen time	30	9.83	4.450	0.697	-0.049
Grammar scores	30	70.17	14.350	-0.043	-0.938

Source: Researcher data processing results

The normality test was run before the correlation analysis to consider which correlation analysis is more appropriate and suitable for this data. The results of the normality test can be seen in Table 2 right below. The result shows the significance value

<sup>15</sup> Andy Field, *Discovering Statistics Using IBM SPSS Statistics*, 5th ed, SAGE Edge (Los Angeles London New Delhi Singapore Washington DC Melbourne: SAGE, 2018), 862.

<sup>16</sup> Asghar Ghasemi and Saleh Zahediasl, "Normality Tests for Statistical Analysis: A Guide for Non-Statisticians," *International Journal of Endocrinology and Metabolism* 10, no. 2 (December 2012): 486–89, <https://doi.org/10.5812/ijem.3505>.

<sup>17</sup> Field, *Discovering Statistics Using IBM SPSS Statistics*, 472.

<sup>18</sup> Julie Pallant, *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using IBM SPSS*, 7th ed (Crows Nest, NSW: Allen & Unwin, 2020), <https://www.routledge.com/textbooks/9781760875534>.

(p-value) for Duolingo screen time is  $< 0.001$ , which is lower than the alpha 0.05. This indicates that the Duolingo screen time data is not normally distributed. On the contrary, the p-value of grammar scores shows a result of 0.347, which is greater than the  $\alpha 0.05$ . It indicates that the data grammar scores is normally distributed.<sup>19</sup>

**Table 2.** Normality Test of Duolingo Screen Time (Minutes) and Grammar Scores

Variable	Shapiro-Wilk		
	Statistic	df	Sig.
Duolingo screen time	0.840	30	$< 0.001$
Grammar scores	0.962	30	0.347

Source: Researcher data processing results

Although the grammar scores met the normality requirement, the overall data were considered and treated not normally distributed, because Duolingo screen time did not meet the normality assumption.<sup>20</sup> Therefore, a non-parametric correlation analysis was employed, namely Spearman's rank-order correlation, in order to avoid the error analysis.

**Table 3.** Correlation between Duolingo Screen Time (Minutes) and Grammar Scores

Variable	Spearman's rho	
	Correlation Coefficient ( $\rho$ )	Sig. (2-tailed)
Duolingo screen time - Grammar scores	0.061	0.749

Source: Researcher data processing results

The Spearman rank-order correlation results in Table 3 right above show the correlation coefficient ( $\rho$ ) at 0.061, which means that there is a relationship between Duolingo screen time and grammar scores, although it is an extremely weak one. And for the correlation significant level, the result is considered not statistically significant, as shown by Sig. (2-tailed) or p-value 0.749, which is greater than  $\alpha 0.05$ .<sup>21</sup> Furthermore, these findings suggest that the relationship of this study may have just happened by chance or coincidence and did not represent a meaningful relationship in statistics analysis.

## Discussion

The findings in this study show that there is a relation, but it is an extremely weak one, with no statistically significant relationship between Duolingo screen time and students' grammar scores. These findings demonstrated that the duration of learning English on Duolingo does not meaningfully relate and associate to grammar achievement among the participants. Furthermore, the result also implies that higher screen time on Duolingo does not necessarily to higher grammar scores. In other terms, the more students spent their time learning on Duolingo doesn't always have a significant relation to their grammar scores.

The descriptive results reveal that participants spent an average of only 9.83 minutes daily on Duolingo ( $SD = 4.45$ ), while grammar scores showed wide variability ( $M = 70.17$ ,  $SD = 14.35$ ). This limited engagement likely reflects fragmented app-based practice rather than sustained grammatical instruction. Consequently, the extremely weak correlation ( $\rho = 0.061$ ) aligns with the reality that brief, self-paced screen time cannot

<sup>19</sup>Field, *Discovering Statistics Using IBM SPSS Statistics*, 347.

<sup>20</sup>Thomas R. Vetter, "Fundamentals of Research Data and Variables: The Devil Is in the Details," *Anesthesia & Analgesia* 125, no. 4 (October 2017): 1375–80, <https://doi.org/10.1213/ANE.0000000000002370>.

<sup>21</sup>Field, *Discovering Statistics Using IBM SPSS Statistics*, 487–88.

substitute for structured grammar teaching. Simply logging short sessions does not guarantee consistent exposure to complex syntactic rules or provide the corrective feedback necessary for structural mastery.

Basically, the findings of this study differ from some previous research that reported positive effects of AI-based or mobile-assisted language learning (MALL) on grammatical competence. Where, the previous studies emphasized the benefits of adaptive feedback and personalized learning paths. However, the present results of this study suggest that these advantages may depend on how Duolingo is used rather than the duration of the usage itself. This suggests that the effectiveness of digital language-learning tools can vary depending on learning contexts, learners' characteristics, and how the application is integrated into the learning process.<sup>22</sup>

Some possible reasons for this finding might be the screen time itself does not fully reflect the quality or effectiveness of learning. And there could be other activities that the students are undertaking on Duolingo app that are not necessarily increasing their grammar proficiency, such as vocabulary mastery, speaking practice, or even leaderboard competition instead. There are also many factors that influence their level of grammar. Some of these factors would be the language proficiency or prior knowledge that students already possess, classroom methods, learning styles, or learning environments beyond Duolingo.<sup>23</sup>

The gamified architecture of Duolingo inherently prioritizes rapid completion and streak maintenance over sustained grammatical reflection. While this design successfully boosts learner motivation and daily engagement, it may inadvertently encourage surface-level processing. Grammar acquisition typically requires explicit rule analysis, contextual application, and error correction, which brief, app-based exercises rarely provide. Consequently, students might accumulate screen time without achieving the deep cognitive engagement necessary for structural language mastery. This mismatch explains why extended usage does not automatically translate into measurable grammar improvement.

Grammar proficiency is heavily influenced by factors beyond standalone app usage, such as classroom instruction, teacher feedback, and learners' foundational linguistic knowledge. Participants in this study likely encountered formal grammar teaching in their university courses, which may have overshadowed or compensated for any incremental gains from Duolingo. Self-directed practice on mobile platforms often functions best as reinforcement rather than primary instruction. Without deliberate integration into structured curricula, isolated screen time remains insufficient to drive significant grammatical development among tertiary-level English learners.

The non-normal distribution of screen time data ( $p < 0.001$ ) further underscores the inconsistent nature of students' usage patterns. Some learners engaged sporadically while others maintained slightly longer streaks, yet this variability failed to predict grammatical

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<sup>22</sup>Nattapan Ngamsom and Rutthaphak Huttayavilaiphan, "Understanding English Achievement Differences Among Undergraduate Students: Influencing Factors and Comparative Insights," *European Journal of Educational Research* 14, no. 1 (January 2025): 267–82, <https://doi.org/https://doi.org/10.12973/eu-er.13.4.267>.

<sup>23</sup>Xuancheng Wu et al., "Learning Factors Influencing Second Language Proficiency: A Cross-Cultural Comparative Study of English and Chinese L2 Learners," *BMC Psychology* 13, no. 1 (July 2025): 850, <https://doi.org/10.1186/s40359-025-03196-9>.

performance, as evidenced by the non-significant p-value (0.749). Statistically, this confirms that screen time operates as an independent behavioral metric rather than a reliable academic predictor. The absence of significance suggests that unregulated mobile practice lacks the systematic progression required for measurable grammatical development.

It is aligned with the Krashen's theory. Even he mentioned that exposure is one of the factors in the language acquisition, but we should not rule out the other factors in learning, such as quality, engagement, or motivation.<sup>24</sup> Additionally, many learners just focus on streak rather than the quality and engagement in learning. Moreover, they should actively engage with the input, in order to make the grammar input they learn be comprehensible.

The absence of a significant correlation also highlights the critical distinction between passive exposure and active, metacognitively regulated learning. Merely logging minutes on a language application does not guarantee focused attention or strategic practice. Learners who consciously monitor their grammatical errors, seek supplementary explanations, and apply rules in writing or speaking tend to outperform those who treat the app as a casual pastime. Future pedagogical approaches should therefore emphasize guided reflection and goal-setting alongside digital practice to transform screen time into meaningful linguistic growth.

Duolingo's algorithm prioritizes vocabulary recognition and quick matching tasks, which likely dominated the participants' limited screen time without translating into grammar proficiency. The 9.83-minute average probably consisted of repetitive, gamified drills emphasizing speed over syntactic accuracy. Without explicit rule explanation or contextualized production, learners may complete lessons without internalizing grammatical structures. This disconnect explains why extended usage yielded no meaningful score improvements. The app optimizes engagement through micro-learning, yet grammar acquisition demands deeper cognitive processing that brief sessions cannot adequately support.

It is important to find out and mention some of the reasons yet factors, in order to find out why there is no significant relationship between variables. Therefore, this discussion serves as a reference for students, in order to make the learning on Duolingo meaningfully and effectively. Moreover, it does matter to ensure that the quality of students' understanding is aligned and equal with the quantity of time they spent.

The findings also relate with one of the surah in the Quran namely surah Al-Asr, verse 1-3. Allah Almighty says.

وَالْعَصْرِ ﴿١﴾ إِنَّ الْإِنْسَانَ لَفِي خُسْرٍ ﴿٢﴾ إِلَّا الَّذِينَ ءَامَنُوا وَعَمِلُوا الصَّالِحَاتِ وَتَوَّصَوْا بِالْحَقِّ وَتَوَّصَوْا بِالصَّبْرِ ﴿٣﴾

**Transliteration:** *Wal' asr, Innal insaana lafee khusr, Illal ladzeena aamanuu wa 'amilus shaalihaati wa tawaashaw bil haqqi wa tawaashaw bis shabr.*

**Translation:** By Al-'Aṣr (the time). Verily, man is in loss, Except those who believe (in Islamic Monotheism) and do righteous good deeds, and recommend one another to the truth [i.e. order one another to perform all kinds of good deeds (Al-Ma'ruf) which Allah has ordained, and to abstain from all kinds of sins and evil deeds (Al-Munkar) which Allah has forbidden], and recommend one another to patience (for the sufferings, harms,

<sup>24</sup>Krashen, *Principles and Practice in Second Language Acquisition*.

and injuries which one may encounter in Allah's Cause during preaching His religion of Islamic Monotheism or Jihad).<sup>25</sup>

This surah implicitly teaches us that time does not guarantee achievement, but rather emphasizes that how we actively treat and manage our time through meaningful actions is what is way more important. Therefore, we should not only prioritize the quantity of learning or anything and rule out its quality, but rather we integrate it, in order to not only show how much it is, but also shows how good it is.

Given the statistically insignificant relationship, educators should position Duolingo as a supplementary reinforcement tool rather than a primary grammar resource. The wide score variability (SD = 14.35) indicates that individual factors like prior knowledge and classroom instruction likely overshadowed app exposure. Future research must move beyond self-reported duration to track actual interaction types, distinguishing time spent on grammar exercises from general vocabulary practice. Combining platform analytics with targeted assessments will clarify which digital behaviors genuinely enhance structural language competence.

Methodologically, this study relied on self-reported screen time and a single grammar assessment, which may not fully capture nuanced learning behaviors or long-term retention. The correlational design also prevents causal inferences regarding app usage and achievement. Subsequent research should employ mixed-method designs, incorporating usage analytics, qualitative interviews, and longitudinal tracking to examine how specific interaction patterns within Duolingo influence grammatical development. Exploring learner autonomy, instructional scaffolding, and task design will provide deeper insights into optimizing AI-assisted language learning environments.

However, the present study has some of limitations. This study may be limited in terms of sample size. Moreover, the analysis is just identifying correlations and does not extend to analyze the cause and effect (regression analysis). These limitations are important to be mentioned, in order to avoid over claiming and interpreting data and result. Therefore, future researcher should improve and involve a larger and widely diverse participant, in order to ensure a better and long-term reliable result.

## CONCLUSION

Based on those findings, this current research shows that there is no significant relationship between Duolingo screen time and the grammar achievement from 30 participants which come from English students at State Islamic University of Madura. We also can conclude that the finding indicates that the amount of learning duration on Duolingo itself is not associated with grammar achievement. However, the finding does not mean that Duolingo is not appropriate and ineffective in improving grammar or in English learning process, but rather acknowledges and emphasizes the fact that the quality of learning, including learners' engagement, focus, and attention in the learning process on Duolingo, could be much more crucial rather than its duration. In addition, the learners may also subconsciously consider Duolingo as a game rather than a learning application.<sup>26</sup>

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<sup>25</sup> Alafasy Berhad, *Alafasy: Prayer & Quran*, English, v. 1.1.3, with Mishary Rasyid Alafasy, Selangor Darul Ehsan, Malaysia: Alafasy Berhad, released 2025, Android, iOS/macOS (mobile application), <https://www.alafasy.co/>.

<sup>26</sup> Sebastian Deterding et al., "From Game Design Elements to Gamefulness: Defining 'Gamification,'" *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, September 28, 2011, 9–15, <https://doi.org/10.1145/2181037.2181040>.

This statement may be a fascinating topic for future research, particularly that can be associated with psychology and learning theories.

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