



Original Article

# A Study of Evaluating the Role of Duolingo in Enhancing Modern Skill Development in Bhiwandi

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## Abstract

The rapid advancement of digital learning technologies has significantly transformed contemporary models of skill development, particularly in the areas of language acquisition and cognitive enhancement. Among various digital platforms, Duolingo has emerged as a widely adopted gamified learning application that promotes self-paced and adaptive education through interactive micro-lessons and reward-based mechanisms. This study examines the role of Duolingo in enhancing modern skill development among learners in Bhiwandi, with specific emphasis on language proficiency, learner motivation, engagement levels, and real-life applicability of acquired skills. A descriptive and analytical research design was employed, utilizing primary data collected from 104 respondents through a structured questionnaire administered via Google Forms. Statistical tools, including descriptive analysis and one-sample *t*-tests, were applied to test the proposed hypotheses and evaluate the effectiveness of the platform. The findings indicate that Duolingo has a statistically significant positive impact on skill enhancement, learner motivation, and sustained engagement, primarily due to its gamified micro-learning approach. Furthermore, respondents reported that the skills developed through the platform are applicable in practical situations such as communication, problem-solving, and confidence building. Although the platform demonstrates strong effectiveness in foundational learning, certain limitations remain in achieving advanced-level mastery and conceptual depth. Overall, the study concludes that Duolingo serves as a valuable supplementary digital tool that supports accessible, technology-driven skill development in the modern educational landscape.

**Keywords:** Digital Learning, Gamification, Skill Development, Learner Engagement, Language Proficiency, Adaptive Education.

## Introduction

In the rapidly evolving landscape of education, the application of technology has transformed traditional skill development models, particularly in language learning and cognitive enhancement. Duolingo, launched in 2011, is one of the first gamified language-learning platforms that uses short lessons, interactive activities, and reward systems to make learning easy, enjoyable, and engaging (Jiang et al., 2024). This study evaluates how Duolingo contributes to skill development, drawing on research evidence that demonstrates its effectiveness in improving listening, reading, speaking, and writing abilities, while also acknowledging ongoing discussions regarding its limited depth for advanced-level mastery (Smith et al., 2024).

Research demonstrates significant improvements in reading, listening, vocabulary, and speaking skills after consistent use. For instance, learners completing Duolingo's Basic English courses (CEFR A2 level) often achieve Intermediate High proficiency, surpassing expected outcomes (Jiang et al., 2024). Similarly, studies on Spanish courses report gains across all language skill domains after approximately 27 hours of engagement, underscoring the app's potential to enhance communicative competence and learner autonomy (Smith et al., 2024). The addition of mathematics and music modules has extended Duolingo beyond languages and helps develop thinking skills, problem-solving, and lifelong learning habits.

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(Electronic Journal of Education, Social Economics and Technology, n.d.). These modules follow Duolingo's gamified and adaptive learning approach, offering personalized practice, instant feedback, and progress tracking, which help learners remain motivated and consistent. By integrating these non-language skills, Duolingo extends its impact beyond communication skills to cognitive, creative, and analytical development, thereby equipping learners with essential modern skills required in today's rapidly evolving digital and professional environment.

However, some critics point out that Duolingo has limitations, particularly in teaching nuanced grammar, cultural understanding, and long-term retention. Studies also suggest that without supplementary learning methods, the long-term effectiveness of the app remains unclear even after many years of research (Monroe, 2025). For educators, including those in finance and literacy programs where the promotion of multiple language proficiency supports global market engagement, Duolingo offers a scalable tool to build foundational skills while fostering resilience and adaptability. (Electronic Journal of Education, Social Economics and Technology, n.d.)

Duolingo enhances the speed of skill development while redefining learning through gamification, which warrants further examination of its educational integration. By examining user outcomes, engagement metrics, and comparative efficacy, this study aims to illuminate pathways for optimizing technology-driven education within skill-centric curricula.

#### Literature review

**(Tuong & Dan, 2024)** - The study aimed to examine the effectiveness of the Duolingo mobile application in improving listening comprehension among EFL learners. It focused on understanding students' perceptions of Duolingo's listening features and their role in language skill development. A mixed-method approach was adopted, involving survey questionnaires and structured interviews with 39 third-year English major students at Can The University, Vietnam. The data were analyzed to evaluate learners' engagement, flexibility, and practice opportunities provided by the application. The findings revealed that students highly appreciated Duolingo for enhancing their listening skills through interactive and repetitive exercises. Regular use of the app contributed to improved vocabulary, grammar understanding, and real-life language comprehension. However, the study also highlighted the need for greater variety in pronunciation, contextual exposure, and improved feedback mechanisms to further enhance learning effectiveness.

**(Kazu & Kuvvetli, 2025)** - This study evaluated Duolingo's effectiveness in boosting English proficiency for 10<sup>th</sup>-grade students. A mixed-methods design combined quasi-experimental testing with phenomenological analysis of perceptions. Sixty students were split into experimental (Duolingo users, 12 weeks) and control groups. Data came from pre-, post-, and delayed Cambridge assessments for listening, speaking, reading, and writing. Repeated Measures ANOVA showed significant gains across all skills

in the experimental group. Students praised Duolingo's engaging, adaptive features in qualitative feedback.

**(González et al., 2025)** -In this research has examined the impact of digital learning platforms such as Duolingo on enhancing reading comprehension skills among young EFL learners. The main aim of the study was to evaluate the effectiveness of Duolingo as a supplementary tool for language acquisition. A randomized controlled intervention was conducted with 150 students divided into control and experimental groups, where the experimental group used Duolingo for 60 minutes daily alongside the regular curriculum. Statistical analysis conducted using Jamovi revealed significant improvements in reading comprehension and vocabulary acquisition among students in the experimental group. The findings confirm Duolingo's positive role in improving reading skills when integrated with traditional teaching methods.

**(Pusparini et al., 2025)**. -Recent studies have explored the integration of artificial intelligence in language education to enhance speaking skills and learner engagement. The primary aim of this research was to examine the effectiveness of AI-supported Duolingo in improving speaking ability and reducing speaking anxiety among vocational students. A mixed-methods approach was employed, combining quantitative analysis through ANOVA and ANCOVA with qualitative interview analysis using MAXQDA. The findings revealed that students using Duolingo demonstrated significant improvements in vocabulary, pronunciation, and fluency compared to the control group. The AI-driven speech recognition and immediate feedback features contributed to a low-anxiety learning environment and increased speaking confidence. However, the study emphasized that real-life speaking practice remains essential for achieving complete communicative fluency.

#### Research Gap

Existing studies on Duolingo mainly focus on its role in English language learning, particularly in improving reading, speaking, vocabulary, and reducing language anxiety, using experimental or qualitative methods among school or vocational students. However, limited research has examined Duolingo's impact beyond language learning, especially in developing modern skills such as music, chess, and mathematics. Additionally, there is a lack of regional-level studies assessing learners' perceptions and skill development within gamified digital learning environments. This study addresses this gap by evaluating Duolingo's role in enhancing modern skill development beyond language learning.

#### Research methodology

This research adopts descriptive and analytical research design to examine the role of Duolingo in enhancing modern skills development. The research focuses on understanding learners' perception, motivation and real-life application of skills acquired by Duolingo.

**Source of Data:** The study is based on primary data collected through a structured questionnaire. The questionnaire was designed using Google Forms and close ended questions.



**Sampling Design:** The target population comprised students, professionals, and individuals using Duolingo for skill development. A convenience sampling technique was adopted due to time and accessibility constraints. A total of 104 respondents participated in the survey.

**Tool for Data Collection:** Data were collected using a structured questionnaire administered through Google Forms. The questionnaire consisted of close-ended questions measured on a five-point Likert scale (Strongly Agree to Strongly Disagree), along with multiple-choice questions. The questions were designed to assess learning effectiveness, motivation, adaptability, and user engagement.

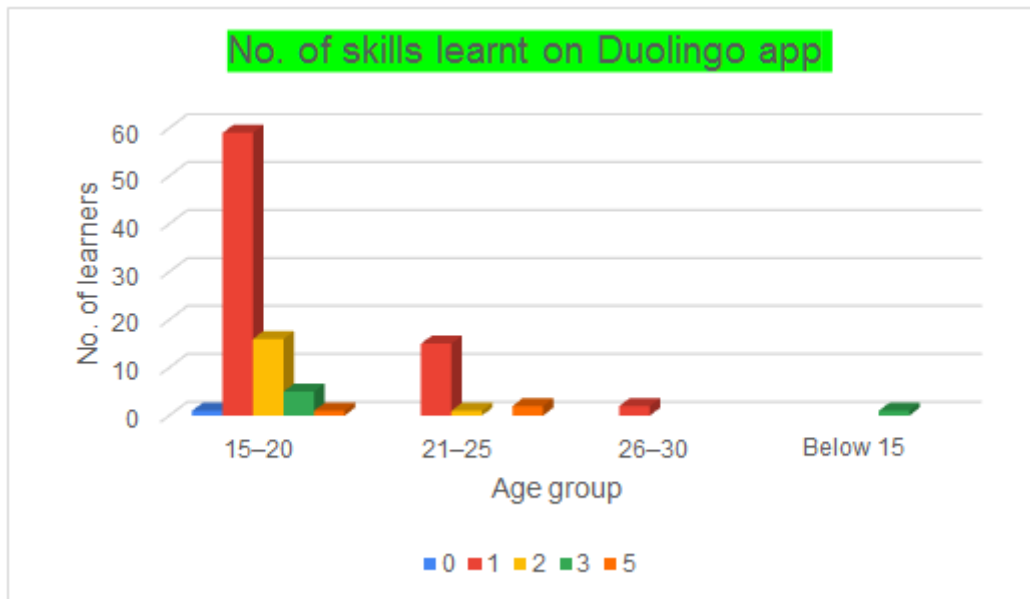
**Scope of study:** The study focuses on evaluating Duolingo as a digital learning platform for modern skill development, including language, cognitive, and motivational skills. The research emphasizes user perceptions rather than experimental performance measurement.

**Limitations:**

- The study is limited to a sample size of 104 respondents.
- The findings are based on self-reported data, which may involve respondent bias.

**Data analysis and Interpretation'**

1. **Duolingo Usage Among Respondents**



2. **Testing of Hypothesis 1: Impact of Duolingo on Modern Skill Development and Learner Motivation**

- Null Hypothesis ( $H_0$ ): Duolingo does not have a significant impact on modern skill development and learner motivation.

- The study does not compare Duolingo with other digital learning platforms.

**Objectives**

1. To examine the role of Duolingo in enhancing modern skill development among learners.
2. To analyse the impact of Duolingo's gamified micro-learning features on learner motivation and engagement.
3. To evaluate the applicability of skills learned through Duolingo in real-life situations.

**Hypothesis**

1.  $H_0$ : Duolingo does not have a significant impact on modern skill development and learner motivation.
2.  $H_1$ : Duolingo has a significant impact on modern skill development and learner motivation.
3.  $H_0$ : Skills learned through Duolingo cannot be effectively applied in real-life situations.
4.  $H_1$ : Skills learned through Duolingo can be effectively applied in real-life situations.

- Alternative Hypothesis ( $H_a$ ): Duolingo has a significant impact on modern skill development and learner motivation ( $\mu \neq 3$ ).

Statistical Tool Used: One-Sample t-Test							
						95% Confidence Interval	
		Statistic	df	p	Mean difference	Lower	Upper
"Skill Development Score"	Student's t	13.0	102	<.001	0.659	0.558	0.760

**Interpretation**

The one-sample t-test was conducted to examine the impact of Duolingo on modern skill development and learner motivation by comparing the mean Skill

Development Score with the neutral value of the Likert scale. The results revealed a statistically significant difference ( $t = 13.00$ ,  $df = 102$ ,  $p < 0.001$ ), with the mean score being significantly higher than the neutral value of 3.



Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, indicating that Duolingo has a significant positive impact on modern skill development and learner motivation among learners.

3. **Testing of Hypothesis 2: Effect of Duolingo's Gamified Micro-Learning Features on Learner Engagement and Motivation**

- Null Hypothesis (H<sub>0</sub>): Gamified micro-learning features of Duolingo do not significantly affect learner motivation and engagement.
- Alternative Hypothesis (H<sub>a</sub>): Gamified micro-learning features of Duolingo significantly affect learner motivation and engagement ( $\mu \neq 3$ ).

Statistical Tool Used: One-Sample t-Test							95% Confidence Interval	
		Statistic	df	p	Mean difference	Lower	Upper	
"Engagement and motivation score"	Student's t	14.8	102	<.001	0.939	0.814	1.06	

**Interpretation**

The one-sample t-test was conducted to evaluate whether Duolingo's gamified micro-learning features significantly influence learner engagement and motivation. The results indicate a statistically significant difference between the observed mean Engagement and Motivation Score and the neutral value of the scale ( $t = 14.80$ ,  $df = 102$ ,  $p < 0.001$ ). Since the mean score is significantly higher than the neutral value, the null hypothesis is rejected and the alternative hypothesis is accepted, concluding that

Duolingo's gamified features and micro-learning format have a significant positive impact on learner engagement and motivation.

4. **Testing of Hypothesis 3: Real-Life Applicability of Skills Learned Through Duolingo**

- Null Hypothesis (H<sub>0</sub>): Skills learned through Duolingo cannot be effectively applied in real-life situations.
- Alternative Hypothesis (H<sub>a</sub>): Skills learned through Duolingo can be effectively applied in real-life situations ( $\mu \neq 3$ ).

Statistical Tool Used: One-Sample t-Test							95% Confidence Interval	
		Statistic	df	p	Mean difference	Lower	Upper	
Real-Life Skill Applicability Score	Student's t	48.4	102	<.001	3.80	3.64	3.95	

**Interpretation**

A one-sample t-test was conducted to examine the real-life applicability of skills learned through Duolingo. The mean Real-Life Skill Applicability Score was found to be 3.80, which is significantly higher than the neutral value

of the Likert scale. The test result was statistically significant ( $t = 48.4$ ,  $df = 102$ ,  $p < 0.001$ ). Therefore, the null hypothesis is rejected, and it is concluded that skills learned through Duolingo can be effectively applied in real-life situations.

5. **Usage Status of Duolingo Among Respondents**

Questions	No	Yes
Count of Do you currently use Duolingo?	24.27%	75.73%
Count of Would you recommend Duolingo to others for learning new skills?	20.59%	79.41%
Count of I enjoy learning on Duolingo more than on other learning apps.	13.04%	86.96%

**Interpretation**

- The table shows that out of 103 respondents, 78 respondents (75.73%) currently use Duolingo, while 25 respondents (24.27%) do not use the application. This indicates that a large majority of the respondents are active users of Duolingo, suggesting a high level of adoption and acceptance of the application among the respondents.
- The table indicates that out of the total respondents, 81 respondents (79.41%) stated that they would recommend Duolingo to others for learning new skills, whereas 21 respondents (20.59%) reported that they would not recommend it. This shows a strong positive inclination among users toward recommending Duolingo, reflecting a high level of satisfaction and perceived usefulness of the application.

- The table reveals that 80 respondents (86.96%) enjoy learning on Duolingo more than on other learning applications, while only 12 respondents (13.04%) do not share this preference. This clearly indicates that Duolingo is perceived as a more enjoyable learning platform compared to other learning apps by the majority of respondents.

**Findings and conclusions**

1. **Findings**

Based on the analysis and interpretation of data collected from 104 respondents, the following key findings

- Most respondents (75.73%) actively use Duolingo, indicating high acceptance of the platform.
- Statistical analysis confirms that Duolingo significantly enhances modern skill development and learner motivation.



3. Gamified features such as streaks, badges, and leaderboards significantly improve learner engagement.
4. A majority of respondents (79.41%) are willing to recommend Duolingo to others.
5. Most learners (86.96%) find Duolingo more enjoyable than other learning applications.
6. Skills acquired through Duolingo are effectively applied in real-life situations.
7. Mathematics and music modules contribute to cognitive development and analytical thinking.
8. Duolingo is best used as a supplementary learning tool rather than a replacement for traditional instruction.

#### Conclusion

Duolingo greatly helps build modern skills with its fun games, personalized lessons, and focus on learners. Stats show it boosts motivation, interest, and learning in students. Its short, interactive lessons make education flexible, fun, and easy to access, especially for self-paced online study. Duolingo excels at basic language and thinking skills but needs extra help for advanced topics or deep culture knowledge. Still, it's a great, widespread tool for diverse places like India. In Bhiwandi, where resources are uneven, Duolingo makes education fairer by closing digital and language gaps. It builds key skills like communication, analysis, and lifelong learning for the global job market. Schools should use it as a helpful add-on in skill-focused programs.

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#### Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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