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## **The Use Of Gamification-Based Duolingo Application In Increasing Student Motivation Is Reviewed From The Theory Of Self-Determination**

**Mirza Muttaqin, Halimi Zuhdi, Ridwan**

Universitas Islam Negeri Maulana Malik Ibrahim Malang, Universitas Islam Negeri Maulana Malik Ibrahim Malang, Universitas Islam Negeri Maulana Malik Ibrahim Malang  
Email: 220104220020@student.uin-malang.ac.id, halimizuhdy@uin-malang.ac.id, ridwan@uin-malang.ac.id

### **Abstrak**

Penelitian ini bertujuan untuk mengevaluasi sejauh mana aplikasi Duolingo berbasis gamifikasi dapat meningkatkan motivasi siswa dalam mempelajari bahasa Arab, terutama pada penguasaan kosakata atau mufrodat, dengan pendekatan teori Self-Determination Theory (SDT). SDT berfokus pada pentingnya motivasi intrinsik, yang didorong oleh tiga aspek utama: otonomi atau kemandirian, kompetensi atau kemampuan, dan keterkaitan atau hubungan yang terjalin dalam konteks belajar. Penelitian ini menggunakan pendekatan kuantitatif dengan desain Survei Deskriptif untuk memberikan gambaran lebih nyata terkait pengaruh penggunaan aplikasi ini terhadap motivasi siswa. Pengumpulan data dilakukan dengan instrumen kuesioner SDT yang mengukur tingkat motivasi siswa melalui tiga komponen utama tersebut. Hasil analisis data menunjukkan adanya peningkatan motivasi yang signifikan di antara siswa yang mengikuti eksperimen. Temuan ini mengindikasikan bahwa aplikasi Duolingo berbasis gamifikasi berperan dalam meningkatkan motivasi intrinsik siswa dalam belajar mufrodat, terutama dengan memperkuat rasa kemandirian, meningkatkan kemampuan yang dirasakan, serta menciptakan rasa keterkaitan atau relevansi dalam proses pembelajaran. Duolingo berbasis gamifikasi memiliki potensi besar sebagai alat efektif dalam pembelajaran bahasa, khususnya dalam membantu meningkatkan motivasi siswa untuk menguasai kosakata baru. Dibuktikan dengan data kuesioner yang mendapatkan nilai 88%.

**Kata Kunci:** Duolingo, gamifikasi, Self-Determination Theory, mufrodat

### **Abstract**

This study aims to evaluate the extent to which the gamification-based Duolingo application can increase students' motivation in learning Arabic, especially in vocabulary mastery or mufrodat, with

the Self-Determination Theory (SDT) theoretical approach. SDT focuses on the importance of intrinsic motivation, which is driven by three main aspects: autonomy or independence, competence or ability, and interconnectedness or relationships that are established in the context of learning. This study uses a quantitative approach with a Descriptive Survey design to provide a more real picture of the influence of the use of this application on student motivation. Data collection was carried out with an SDT questionnaire instrument that measured the level of student motivation through the three main components. The results of the data analysis showed a significant increase in motivation among students who participated in the experiment. These findings indicate that the gamification-based Duolingo application plays a role in increasing students' intrinsic motivation in learning mufrodat, especially by strengthening a sense of independence, improving perceived abilities, and creating a sense of connectedness or relevance in the learning process. Gamification-based Duolingo has great potential as an effective tool in language learning, especially in helping to increase students' motivation to master new vocabulary. It is evidenced by the questionnaire data which got a score of 88%.

**Keywords:** Duolingo, gamification, Self-Determination Theory, mufrodat

## Introduction

Mufrodat is an important element in language skills, and the more mufrodat you have, the more language skills you have.<sup>1</sup> Mufrodat is a set of words that are known to the public and they use them to compose or create sentences and communicate with them.<sup>2</sup> that mufrodat is a set of words that a person has in Arabic that is influenced by the mufrodat used in that language."<sup>3</sup>

It is very important for students learning Arabic to learn mufrodat for several reasons. First, mufrodat is a very important foundation that allows students to understand the meaning of sentences and their context. Second, mastery of mufrodat helps students speak, write, listen, and read better. Third, a broad mastery of mufrodat helps students

understand the grammar (rhyme and rhythm) better. Fourth, the mastery of a wide mufrodat also helps students understand.<sup>4</sup>

Mufrodat learning is one of the fundamental aspects of language mastery, including in learning Arabic. Mufrodat is the main key for students to understand the meaning of words, structure sentences correctly, and communicate effectively. Without adequate mastery of mufrodat, language learning as a whole cannot run optimally. Therefore, effective methods and strategies in teaching mufrodat are an urgent need in language education, especially for beginner learners.<sup>5</sup>

In recent decades, educational technology has developed rapidly, partly due to the emergence of digital-based language

learning applications such as Duolingo. Duolingo is considered an innovative learning aid due to its gamification approach, a method that incorporates elements of play (also known as games) into education to increase students' motivation to learn and increase their engagement. This approach is considered effective because it results in students who are more eager to participate.<sup>6</sup>

Duolingo is a free foreign language learning for kids created by Luis von Ahn and Severin Hacker with a game-like method. The app is available in a web version and is also available in Android, iOS, and Windows Phone versions.<sup>7</sup> Duolingo aims to create an easy yet effective learning experience for its users. Benefits of the Duolingo application Improve foreign language vocabulary, especially Arabic. From this platform, the vocabulary will increase by at least five to ten words. Improve foreign language skills As your vocabulary increases, your foreign language skills improve, and as students progress in their skills, their learning intensity increases.<sup>8</sup> In the 21st-century learning era, the use of technology is a fundamental need in developing learning skills. Students are required to master the efficient and wise use of technology in daily activities. Teachers also need to adopt innovative learning methods.<sup>9</sup>

Duolingo is a concrete example of the transformation of contemporary education, integrating technology with essential elements such as the development of creative thinking, the improvement of communication skills, the optimization of productivity, and the spiritual aspect. Through a comprehensive learning approach, Duolingo not only provides language materials but also equips users with relevant essential skills to face future global challenges. This innovation reflects a significant shift in learning methods, where technology plays a role as a catalyst in enriching the modern educational experience.

Based on initial observations, respondents stated that Duolingo as a learning medium is very fun. The app uses gamification to present Arabic grammar material in a game format, combining audio and video. Duolingo is popular among learners learning a new language, making it interactive learning and motivating to practice further. Duolingo users appreciate the attractive, free interactive design, and clear information that makes it easy to use. The gamification element in Duolingo is rated positive because it motivates users to learn and actively engage. Users also appreciate the feedback feature that responds to every activity and error in the app.

Self-Determination Theory Approach, This theory was introduced by Richard Ryan and Edward Deci in 1985. Self-Determination Theory (SDT) is a comprehensive theory of human motivation, which focuses on the development and function of behavior in the social environment. In this theory, motivation or encouragement to do activities is an important component that is believed to be able to maintain behavior and changes that occur. Self-determination theory (SDT) identifies two types of motivation, namely intrinsic motivation (autonomous motivation) and extrinsic motivation (controlled motivation).<sup>10</sup>

Gamification in Duolingo is designed to support the fulfillment of basic psychological needs described in *Self-Determination Theory* (SDT): 1) *Autonomy*, 2) *Competence*, and 3) *Relatedness*.<sup>11</sup> This approach facilitates more directed and interactive learning, by giving users more control in determining their learning paths, designing experiences that reinforce a sense of competence through challenges and achievements, and connecting them with learning communities that encourage social support. In this way, Duolingo is not only a language learning tool but also a motivating environment, where students feel more motivated to continue

learning and develop themselves in mastering the language.

## 1. Autonomy

- a. Choice and Control in Learning: In Duolingo, users can choose the topic or mufrodat unit they want to learn first. Users also have the freedom to repeat the material as per their needs. With this option, users feel more control over their learning process, thereby increasing intrinsic motivation.<sup>12</sup>
- b. Time and Frequency Determination: Duolingo gives users the freedom to decide for themselves when and how often they study. Users can learn at their own pace, which fulfills the autonomy aspect and helps create a long-term commitment to mastering mufrodat.<sup>13</sup>

## 2. Competence

- a. Level, Challenge, and Point System: Every time a user completes a practice or test, they earn points called "XP" (experience points) and can move up to higher levels. This gives them a sense of accomplishment, boosts their

confidence, and makes them feel more competent.

- b. **Live Feedback:** Duolingo provides live feedback in the form of auto-corrections, so users know the mistakes and achievements in real time. This system helps users understand areas that still need to be improved and feel more capable of understanding mufrodat.
- c. **Repetitive Exercises and Spaced Repetition System:** Duolingo integrates spaced repetition to optimize mufrodat mastery. This structured repetition helps users remember vocabulary effectively, ultimately increasing their confidence and competence in Arabic.<sup>14</sup>

### 3. Relatedness

- a. **Learning Communities and Leaderboards:** Users can see their rankings among friends or other users through leaderboards, which encourages social motivation. This healthy competition fosters a sense of connectedness and builds the spirit to keep going.<sup>15</sup>
- b. **Achievement and Sustainability Circle System (Streaks):** Users can

build streaks or the number of consecutive days of learning, which creates a sense of connection to the app and maintains intrinsic motivation through consistent achievement.<sup>16</sup>

- c. **Support and Interaction:** Duolingo allows users to encourage each other or participate in discussion forums, which fosters a sense of belonging within a community of common language learners. In the context of SDT, this kind of interaction helps meet the need for relatedness, where users feel valued and supported in their learning process.

With an SDT-based gamification approach, Duolingo not only increases user motivation to master Arabic mufrodat but also creates a fun and effective learning experience. By meeting the needs of autonomy, competence, and relatedness, users are more motivated to learn continuously and deepen their mastery of Arabic vocabulary consistently.

The gamification approach in apps like Duolingo is closely related to *Self-Determination Theory* (SDT). SDT states that a

person's intrinsic motivation is influenced by three basic psychological needs, namely autonomy (freedom of choice), competence (feeling capable and skilled), and connectedness (feeling connected to others). Through the gamification features in Duolingo, students are expected to feel the freedom to manage their learning, increase their sense of competence through challenges, and feel connected through social features.<sup>17</sup>

Gamification also utilizes the concepts of rewards, achievements, and progress *tracking*, all of which can increase students' intrinsic motivation. The use of these elements in the Duolingo application is considered to be able to make students more motivated to continue learning, repeat lessons, and consistently develop mastery of mufrodat. However, despite the popularity and use of the app by millions, there is still little research on how gamification strategies in Duolingo specifically affect mufrodat mastery, especially in the context of learning Arabic.

Previous research has shown that the use of the Duolingo application has an impact on student learning outcomes, as shown in a study conducted by <sup>18</sup> On the Application of E-learning with the

Duolingo Application to Increase the Learning Motivation of Elementary School Students, this study aims to explore the advantages of Duolingo, a gamification-based application, in supporting foreign language learning in elementary schools, especially in improving student learning motivation. The results of this study show that interactive features such as daily challenges, virtual rewards, and live feedback provided by Duolingo can increase student engagement and motivation in language learning, as well as research conducted by <sup>19</sup> The Analysis of the Effectiveness of the Duolingo Application as a Basic Level BIPA Learning Media, this study aims to find out how effective the Duolingo application is in helping the BIPA learning process at the elementary level. The results of this study are that Duolingo has many features that can make learning more enjoyable and the learning materials are also by the competency standards for basic BIPA learners. It can be concluded that Duolingo is quite effective and can be used as a BIPA learning medium at the beginner level.

Based on the results of the above research, Duolingo shows that this application is very supportive of the language learning process, especially for beginners. Gamification features, such as

daily challenges and rewards, provide a fun and challenging learning experience, which is crucial in keeping students motivated. In addition, the suitability of Duolingo materials with competency standards makes them reliable for learning foreign languages. Even so, maybe the results will be maximized if Duolingo is used as a complement to other learning methods, not as the only learning resource.

The urgency of this study is driven by the fact that many students face difficulties in learning mufrodat, especially in memorizing new words and using them in the right context. Traditional learning methods that tend to be monotonous are often not enough to overcome this problem. With the gamification strategy in Duolingo, and with the self-determination theory approach, there is an opportunity to explore new, more interesting, and effective approaches to improve mufrodat mastery.

## **Method**

This study adopts a quantitative research design with a Descriptive Survey approach to explore the effectiveness of the Duolingo application in vocabulary learning. In this case, the researcher uses the design of the Descriptive Survey approach.<sup>20</sup>, This quantitative approach was chosen to analyze

how the Duolingo application that integrates gamification elements can affect students' motivation in learning mufrodat, concerning Self-Determination Theory. In addition, this study also aims to evaluate the extent to which the use of the application can increase students' intrinsic motivation in the mufrodat learning process.

By using a quantitative approach, this study provides convenience in collecting systematic and structured data, so that researchers can identify relevant themes and patterns based on empirical evidence obtained from the field. Through the analysis of the data obtained, the researcher hopes to provide deeper insights into the impact of the use of the gamification-based Duolingo application on student learning motivation, as well as its implications for classroom teaching methods. To change the sentence to be more scientific, this approach allows for a more objective and measurable evaluation, so that the results of the research can make a significant contribution to the development of more effective language learning strategies in the future.

## **Population and Sample**

The population in this study consists of all grade VII students in MTsN 1 Malang. This population includes all students enrolled

in grade VII in the ongoing school year. All of these students are part of the research population. The sample of this study is from class A (Language) 26 students. The selection of the sample is carried out based on certain criteria to ensure the representativeness and accuracy of the research results.

### Research Procedure

This study uses a quantitative method with a quasi-experimental design.<sup>21</sup> The experimental class used Duolingo during Three meetings, students in the class filled out a *Self-Determination Theory questionnaire* to assess their motivation to learn, especially the aspects of *autonomy*, *competence*, and *relatedness*. The data obtained were analyzed to see the difference in learning outcomes between the two groups and the impact of gamification on student learning motivation.

### Data Collection Techniques

Descriptive Survey with Self-Determination Theory Questionnaire (SDT), This questionnaire is given to students in an experimental class after the intervention to measure their learning motivation in aspects such as *autonomy*, *competence*, and *relatedness*, by the theory of Self-Determination. The data obtained will be

analyzed descriptively to describe the level of student motivation after the intervention.

### Data Analysis Techniques

Analysis of the Self-Determination Theory (SDT) Questionnaire, the Self-Determination Theory (SDT) Questionnaire is analyzed to measure the level of student motivation in three main aspects: *autonomy*, *competence*, and *relatedness*. The results of the questionnaire were processed using descriptive statistics to get an overview of the level of student motivation. In addition, a correlation test can be applied to identify the relationship between students' learning motivation and increased mastery of mufrodat. This analysis allows researchers to understand the impact of gamification in increasing students' intrinsic motivation in mufrodat learning.<sup>22</sup>

Interpretation of Observation Data, Data obtained from observations are analyzed descriptively to understand students' responses to the Duolingo application. These observations provide qualitative information about student engagement, how they interact with the app, and their reactions during the gamification-based learning process. These findings are used as support for quantitative analysis to gain deeper insights into the role of gamification in learning Arabic vocabulary.

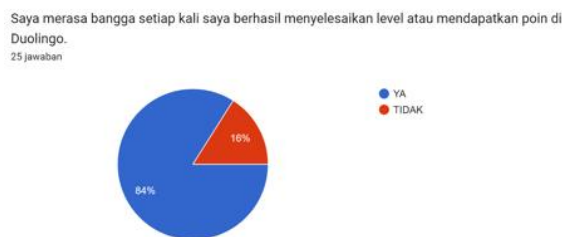


With this analysis technique, this study can provide a comprehensive conclusion about the effectiveness of the gamification-based Duolingo application on increasing mufrodat mastery and student learning motivation.<sup>23</sup>

## Results and Discussion

### Analysis of Increasing Student Motivation With the Self-Determination Theory Approach on Mufrodat Mastery

The results of the research carried out in grade VII, consisting of 26 students, showed the following findings:



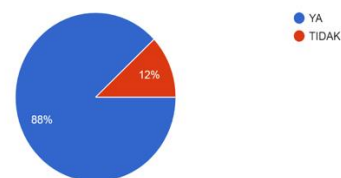
**Diagram 1**

The diagram above shows the results of feeling proud every time you complete a level or earn points in the Duolingo app. Of the 23 respondents, 84% (in blue) answered "YES," indicating that the majority of participants felt proud when they achieved their achievements on Duolingo. Meanwhile, 16% (in red) answered "NO," meaning a small percentage of participants did not feel that

pride. Overall, this diagram shows that most users feel motivated and proud of their achievements in using language learning apps.

The diagram concludes that the majority of students feel proud every time they complete a level or earn points on the Duolingo app. This shows that the achievement features in this application have succeeded in increasing student motivation and satisfaction in learning languages. Only a small percentage do not feel pride, which may be due to individual factors or different learning preferences. Overall, these results indicate that the gamification element in Duolingo is effective in encouraging users' enthusiasm for learning.

Saya merasa lebih termotivasi karena saya bisa mengatur kecepatan belajar saya sendiri di Duolingo.  
25 jawaban



**Diagram 2**

The diagram above shows the responses of 25 respondents regarding the effect of self-paced learning on their motivation to learn in the Duolingo app. A total of 88% of respondents, who are marked in blue on the diagram, answered "YES,"

indicating that most users feel more motivated when they can determine for themselves how fast or slow they want to learn. This reflects that the feature that allows users to set the learning pace according to their personal needs is highly appreciated and effective in increasing motivation.

In contrast, 12% of respondents, who were marked in red, answered "NO," meaning they did not feel an increase in motivation despite being able to set the pace of learning. It is possible that for this small group, other factors may be more important to increase their motivation to learn, such as elements of gamification or external encouragement.

From the results of this survey, it can be concluded that the ability to set the learning pace independently on Duolingo has a significant positive impact on learning motivation for most users. This feature provides flexibility that allows users to learn according to their rhythm and schedule, thereby reducing stress or anxiety due to having to follow a certain tempo. It also shows that personalization in learning methods can be an important key to maintaining the spirit of learning in language learning apps like Duolingo. On the other hand, some users may have different preferences or need to be motivated, so the

app may also need to consider additional motivational strategies that can meet the diverse needs of its users.

## **Conclusion**

Based on the results of the research, it can be concluded that the Duolingo application is gamification-based in increasing students' motivation in learning Arabic, especially in mastering mufrodat or vocabulary. Using the Self-Determination Theory (SDT) approach, this study evaluates the role of psychological aspects such as autonomy, competence, and connectedness in the learning process. Gamification elements on Duolingo, such as the free choice to set the pace of learning, the point and level system, and daily challenges, have been proven to help increase students' intrinsic motivation. The survey results show that most students feel more excited and motivated when they can determine their learning path and achieve achievements in the application.

These findings confirm that apps like Duolingo, with their gamified design, can create interactive and enjoyable learning experiences, especially for beginners. In addition to boosting motivation, Duolingo also helps students remember new vocabulary more effectively through repetitive exercises and hands-on feedback. The presence of

learning communities and competition features such as leaderboards provide a social boost that strengthens the connection between users. Overall, this study concludes that Duolingo can be an effective language learning tool, but the results will be more optimal when used as a complement to other learning methods.

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