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# EXPLORING THE ENHANCEMENT OF COGNITIVE SKILLS (ATTENTION AND MEMORY) AND MOTIVATION STIMULATION THROUGH GAMIFICATION TOOLS IN FOREIGN LANGUAGE LEARNING

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**Abstract:** Gamification – the integration of game elements into the educational process – has become popular in recent years in foreign language learning, as this approach stimulates mental resources, activating attention and memory. Studies show that when gamification is applied, learners' working memory and attention significantly improve. For example, according to data from The Open Psychology Journal, game elements such as points, rewards, and leveling help learners concentrate and enhance their ability to process complex linguistic materials. Additionally, gamification makes repetition of language topics more interesting, aiding better retention of information in memory. This article examines gamified tools such as Duolingo, Kahoot, and Quizizz, and analyzes their impact on English language learning among individuals aged 10-30, including cognitive skills (memory, attention, adaptability) and motivation.

**Keywords:** Gamification, foreign language learning, cognitive achievements, Duolingo, Kahoot, Quizizz, motivation, youth education.

## Introduction :

In the digital era, gamification has emerged as a transformative tool in education, particularly in foreign language acquisition. Defined as the application of game design elements in non-game contexts, gamification uses elements such as points, badges, leaderboards, and challenges to increase engagement and learning outcomes. In English Language Learning (ELL) among adolescents and young adults (aged 10-30), gamified tools address common issues like low motivation, short attention spans, and difficulties in retaining vocabulary or grammar. This demographic, often recognized as digital natives, responds well to interactive platforms that resemble gaming experiences. Studies show that gamification not only improves linguistic proficiency but also enhances cognitive functions such as memory, attention, and cognitive flexibility. This article reviews the effectiveness of tools like Duolingo, Memrise, Kahoot, and Quizizz, highlighting benefits and limitations for youth based on empirical evidence from recent research, thereby guiding educators in implementing these tools.

## Types of Gamified Tools

Several platforms utilize gamification for foreign language learning. Mobile apps like Duolingo and Memrise focus on vocabulary reinforcement, providing memorization through quizzes and flashcards. Duolingo encourages consistent practice through streaks, points, and daily goals, while Memrise uses spaced repetition and mnemonic devices. According to a study in Frontiers in Psychology (Pichugin et al., 2023), Duolingo users aged 19-22 retained vocabulary better than those using Memrise or traditional methods. Online quiz systems, such as Kahoot and

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Quizizz, facilitate interactive classroom activities. Kahoot incorporates real-time competition and leaderboards, boosting engagement; in Aibar-Almazán et al.'s (2024) study, university students (average age 19) improved attention and creative thinking with 30-60 minutes of weekly Kahoot use. Quizizz allows self-paced quizzes with immediate feedback, useful for homework. In Indonesian high schools, Akhyar and Roslaini (2025) reported that 16-year-old students improved reading comprehension and motivation after five weeks of Quizizz use. Other tools, like customized games such as "Among Us," have been used in classrooms to enhance language skills and motivation in younger learners (Open Psychology Journal, 2024).

**Research Methodologies**

Recent studies employ various methods: randomized controlled trials (RCTs), quasi-experimental designs, and mixed methods. For example, Aibar-Almazán et al. (2024) conducted an RCT with 73 university students (age 19), dividing them into groups based on Kahoot exposure (0, 30, 60 minutes/week). Pichugin et al. (2023) used an experimental design with 203 students (19-22 years) to compare Duolingo and Memrise. Quasi-experimental approaches include Akhyar and Roslaini's (2025) five-week study, where 40 11th-grade students (~16 years) were split into experimental (Quizizz) and control groups. Mixed methods are supplemented with surveys; Shen et al. (2024) surveyed Chinese university students and linked data to learning outcomes using Structural Equation Modeling (SEM). These methodologies provide robust evidence, though some studies with small samples limit generalizability.

**Table 1: Summary of Key Studies**

| Author (Year) | Participants | Gamification Tool | Methodology | Key Findings |
|---|---|---|---|---|
| Pichugin et al. (2023) | 203 students (19-22 years) | Duolingo, Memrise | Experimental (control and experimental groups) | Duolingo group outperformed Memrise and traditional methods in vocabulary expansion and memory consolidation. |
| Aibar-Almazán et al. (2024) | 73 students (average 19 years) | Kahoot | Experimental (0, 30, 60 minutes/week) | Longer Kahoot use improved attention, creative thinking, and problem-solving abilities. |
| Akhyar & Roslaini (2025) | 40 11th-grade students (~16 years) | Quizizz | Quasi-experimental (5 weeks) | Quizizz increased reading comprehension |

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|---|---|---|---|---|
| | | | | and motivation. |
| Mahmoudi et al. (2025) | 40 4th-grade students (9-10 years) | Electronic gamification | Semi-experimental (MANCOVA) | Gamification increased children's attention and cognitive flexibility. |
| Shen et al. (2024) | Chinese university students | General gamification elements | Survey + SEM analysis | Gamification positively influenced learning outcomes through motivation. |
| Luo (2023) | Meta-review of 21 studies | Various tools | Systematic review | Mixed results; positive in motivation, but variable in long-term cognitive gains |

Cognitive Achievements

Gamification develops a range of cognitive skills in foreign language learning. Working memory and retention improve as game elements encode complex information; Duolingo's repetitive challenges aid vocabulary recall (Open Psychology Journal, 2024). Attention concentration is enhanced by time limits and leaderboards; Aibar-Almazán et al. (2024) observed better attention in Kahoot users. Cognitive flexibility, the ability to adapt thinking, increases in younger groups; Mahmoudi et al. (2025) found improvements in 9-10-year-olds. For adolescents (15-17), Quizizz supports comprehension (Akhyar & Roslaini, 2025). In young adults (18-25), Kahoot improves problem-solving (Frontiers, 2024).

**Motivation and Engagement**

Game elements intrinsically motivate learners, boosting self-confidence through badges and levels (Open Psychology Journal, 2024). Quizizz promotes autonomy with self-pacing and feedback, enhancing competence (Akhyar & Roslaini, 2025). Social aspects, like competition in Kahoot, increase interaction and group motivation (Frontiers, 2024). Pichugin et al. (2023) noted that Duolingo users felt more competent in language skills.

**Age-Related Outcomes**

The impact varies by age group. In children (10-14 years), gamification boosts attention and flexibility (Mahmoudi et al., 2025). Adolescents (15-17) improve comprehension and interest via Quizizz (Akhyar & Roslaini, 2025). Young adults (18-25) enhance creativity and attention

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with Kahoot (Aibar-Almazán et al., 2024). Overall, younger ones respond better to playful elements, while adults prefer competition.

**Limitations and Future Directions**

Studies sometimes yield conflicting results; Luo's (2023) review of 21 experiments noted short-term positive effects but variability due to methodological flaws and novelty effect fading. Limitations include small samples and focus on basic elements. Future research should explore long-term designs, cultural differences, and age-tailored tools (Open Psychology Journal, 2024).

**Conclusion**

Gamified tools like Duolingo, Kahoot, and Quizizz significantly improve ELL and cognitive skills among youth aged 10-25. They enhance memory, attention, flexibility, and motivation, with age-specific benefits. However, methodological limitations exist. Future robust RCTs and long-term observations are necessary to enhance effectiveness.

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