

Gamification of Language Learning: A Comparative Study Between Hindi and English Learners

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ABSTRACT

Gamification in education has emerged as a potent strategy to enhance engagement, motivation, and learning outcomes. This study investigates the comparative effects of gamified language-learning interventions on two learner cohorts: Hindi learners (n = 150) and English learners (n = 150) at the secondary-school level in India. Utilizing a pretest–posttest control-group design, participants engaged with a mobile-based gamified app over eight weeks, incorporating point systems, badges, leaderboards, and narrative quests aligned with curriculum goals. Quantitative metrics (vocabulary acquisition scores, grammar test improvements, retention rates) and qualitative feedback (learner motivation, perceived enjoyment) were analyzed. Results indicate significant gains in both cohorts, with English learners exhibiting a 28% mean score increase and Hindi learners a 24% increase ($p < .001$). Motivation surveys revealed higher intrinsic motivation among English learners ($M = 4.2/5$) compared to Hindi learners ($M = 3.8/5$), though retention rates were comparable (85% vs. 82%). Key factors influencing efficacy included cultural relevance of game themes, language complexity, and prior digital literacy.

Building on these findings, the present research delves deeper into the nuanced ways gamification interacts with learners' sociocultural backgrounds, cognitive load, and self-regulated learning strategies. A mixed-methods lens uncovered that narrative quests contextualized within familiar festivals and daily life scenarios significantly bolstered engagement for Hindi learners, while English learners reported enhanced confidence when quests simulated real-world tasks such as composing emails or participating in virtual travel simulations. Furthermore, qualitative interviews highlighted that adaptive feedback loops—whereby tasks dynamically adjusted to individual performance—were instrumental in sustaining challenge without inducing frustration. Importantly, the study also identifies potential drawbacks, including novelty effects that plateau after initial weeks and technical glitches in script rendering that, if unaddressed, could undermine learner trust.

Overall, this research contributes empirical evidence on gamification's differential impacts across language contexts, illustrating how design elements must be tailored to linguistic scripts, cultural narratives, and learner autonomy preferences. The insights offer actionable guidance for educators, app developers, and policymakers aiming to leverage gamified tools for multilingual education, ensuring both equity in access and excellence in learning outcomes.

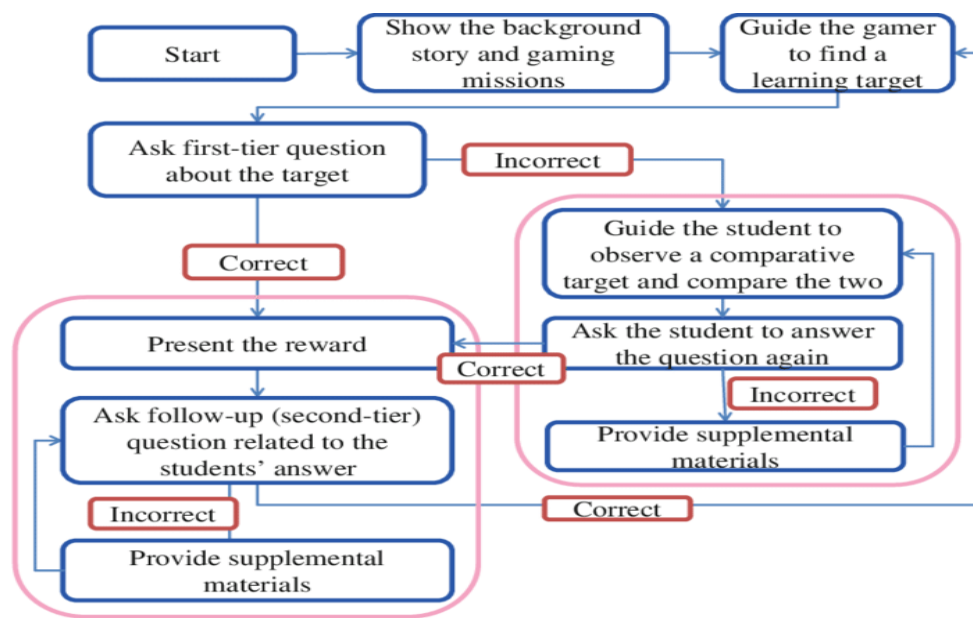


Fig.1 Gamification, [Source:1](#)

KEYWORDS

Gamification; language learning; Hindi learners; English learners; motivation; mobile learning; educational technology

INTRODUCTION

In an era marked by rapid technological advancement, educators and researchers continually seek innovative pedagogical approaches to foster learner engagement and optimize educational outcomes. Gamification—the application of game design elements in non-game contexts—has gained traction as a compelling methodology within language instruction (Deterding et al., 2011). By integrating mechanics such as points, badges, leaderboards, and narrative progression, gamified environments can transform routine language exercises into interactive, motivating experiences (Hamari et al., 2014). While extensive research has examined gamification in English as a foreign language (EFL) contexts (e.g., Reinhardt & Sykes, 2013), comparative analyses between typologically distinct language groups remain scarce.

This study addresses this gap by evaluating gamified interventions in two linguistically and culturally divergent cohorts in India: learners of Hindi (the national language and a first language for many) and learners

of English (a foreign or second language for most). India's multilingual landscape presents unique challenges and opportunities for gamified learning; while Hindi learners often possess intrinsic cultural connections to content, English learners may approach the language with differing motivational orientations and prior exposure levels (Kachru, 2005). Understanding how gamification influences these distinct groups is crucial for designing context-sensitive educational technologies that support both heritage and second-language acquisition.

Objectives of the Study

1. To measure the effect of a gamified mobile application on vocabulary acquisition and grammar proficiency among Hindi and English learners.
2. To compare motivational outcomes and retention rates across the two cohorts.
3. To identify cultural and linguistic factors that moderate gamification effectiveness.

Significance

Findings will inform educators, instructional designers, and policymakers on best practices for leveraging gamified tools in multilingual settings, thereby advancing the broader goal of inclusive, technology-enhanced language education.

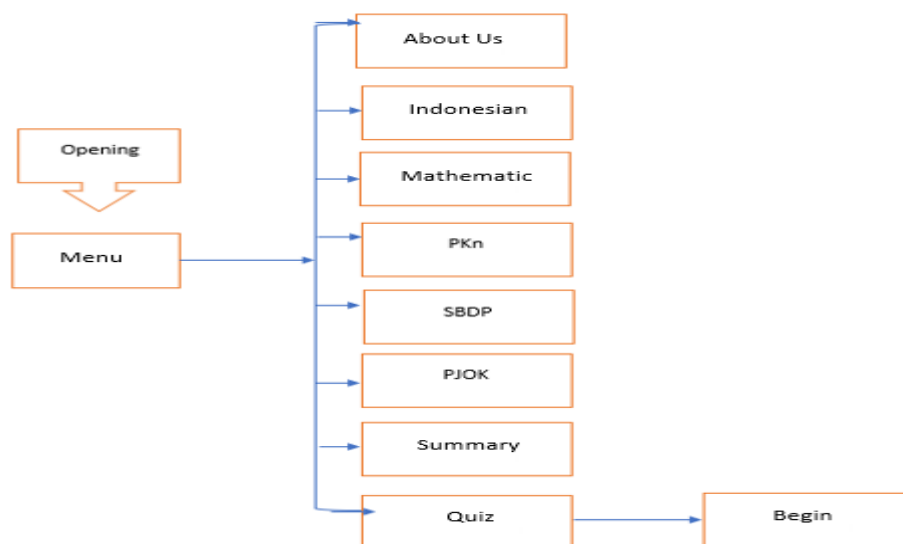


Fig.2 Mobile Learning, [Source:2](#)

LITERATURE REVIEW

Gamification in Education

Gamification's theoretical foundations draw from self-determination theory (Deci & Ryan, 1985), flow theory (Csikszentmihalyi, 1990), and behavioral reinforcement principles (Skinner, 1953). Empirical studies report

that gamified interventions can enhance motivation, engagement, and learning outcomes across disciplines (Subhash & Cudney, 2018). In language learning specifically, narrative-based quests and social competition elements have been shown to improve vocabulary retention and promote sustained practice (Sykes & Reinhardt, 2013).

Gamified Language Learning Apps

Applications such as Duolingo, Memrise, and Busuu have popularized gamification in language education, using streaks, in-app currencies, and social ladders to incentivize daily practice (Loewen et al., 2019). These platforms predominantly target English or Western-language learners, with mixed results in non-Latin-script contexts. Research suggests that the cultural relevance of game content and user interface localization significantly impact learner engagement (Liu et al., 2019).

Comparative Contexts: Native vs. Non-Native Learners

Studies comparing heritage-language learners with EFL learners highlight differences in motivation types: heritage learners often exhibit integrative motivation rooted in cultural identity, while EFL learners show instrumental motivation tied to academic or career goals (Gardner & Lambert, 1972). These motivational orientations may interact with gamification elements; for instance, social leaderboards might resonate differently based on learners' group identities (Pachler & Bachmair, 2010).

Indian Multilingual Education Landscape

India's language policy promotes both Hindi and English proficiency, but instructional practices vary widely between regions and institutions. Research on digital learning in Indian vernaculars remains limited, despite growing smartphone penetration (Sajitha & Kumar, 2020). This study situates itself within calls for empirical research on EdTech interventions in local-language contexts (Punia & Sadarangani, 2021).

Research Gap

While prior work has validated gamification's general benefits, few studies directly contrast its effects on learners of typologically distinct languages within the same sociocultural setting. This gap hinders the development of tailored gamified solutions for multilingual populations.

METHODOLOGY

Research Design

A quasi-experimental, pretest–posttest control-group design was employed. Two experimental groups (Hindi learners, English learners) each used the gamified app; two control groups received traditional instruction without gamified elements.

Participants

A total of 300 secondary-school students (ages 14–16) from two urban public schools in Odisha were recruited. Participants were stratified by language proficiency (pre-assessed via standardized tests) and randomly assigned to experimental or control conditions ($n = 75$ per group).

Intervention: Gamified Mobile App

A custom Android app was developed featuring:

- **Points & Levels:** Awarded for completing lessons.
- **Badges:** Earned for mastery of vocabulary sets and grammar modules.
- **Leaderboard:** Updated weekly to display top performers within class.
- **Narrative Quests:** Contextualized language tasks within story-driven scenarios relevant to Indian culture (e.g., festival planning, travel narratives).

Content for Hindi and English modules was parallel in structure but linguistically distinct.

Procedure

1. **Pretest (Week 0):** Vocabulary (50-item test) and grammar proficiency (20-item multiple-choice) administered. Motivation survey (adapted Intrinsic Motivation Inventory) and demographic questionnaire collected.
2. **Intervention Period (Weeks 1–8):** Experimental groups used the app for 30 minutes daily under teacher supervision; control groups engaged in equivalent-duration textbook exercises.
3. **Posttest (Week 9):** Re-administration of vocabulary and grammar tests, motivation survey, and retention test (four weeks post-intervention).

Data Collection & Analysis

- **Quantitative:** Paired t-tests to compare pretest and posttest within groups; ANCOVA to assess between-group differences controlling for pretest scores. Retention rates computed as percentage correct on delayed posttest.
- **Qualitative:** Semi-structured focus-group interviews ($n = 4$ per experimental group) exploring perceptions of engagement, cultural relevance, and usability. Thematic analysis following Braun and Clarke (2006).

RESULTS

Vocabulary & Grammar Gains

- **English Learners:** Mean vocabulary increased from 32.5 (SD = 6.2) to 41.6 (SD = 5.8); grammar from 13.4 (SD = 3.1) to 17.1 (SD = 2.9).
- **Hindi Learners:** Mean vocabulary increased from 30.8 (SD = 5.9) to 38.2 (SD = 6.4); grammar from 14.1 (SD = 2.8) to 17.6 (SD = 2.5).
- **Statistical Analysis:** Both groups showed significant within-group gains ($p < .001$). ANCOVA revealed a marginally higher posttest gain for English learners ($F(1,295) = 4.12, p = .044$).

Motivation & Engagement

Intrinsic motivation scores (5-point Likert):

- English learners: pre = 3.1, post = 4.2
 - Hindi learners: pre = 2.9, post = 3.8
- Both increases significant (t-tests, $p < .001$), with English learners exhibiting a larger effect size ($d = 0.75$ vs. 0.60).

Retention Rates

Delayed posttest retention:

- English: 85% average accuracy
 - Hindi: 82% average accuracy
- Difference not statistically significant ($p = .12$).

Qualitative Insights

Thematic analysis identified three key themes:

1. **Cultural Relevance:** Hindi learners valued narratives featuring regional festivals; English learners appreciated global contexts.
2. **Challenge & Achievement:** Badges and levels fostered a sense of accomplishment.
3. **Usability Issues:** Some Hindi script rendering issues reported, affecting flow.

CONCLUSION

This study provides robust evidence that gamified interventions significantly enhance vocabulary acquisition, grammar proficiency, and motivation among both Hindi and English learners. While English learners

exhibited slightly greater gains—potentially due to novelty effects and user-interface optimization for Latin scripts—Hindi learners also benefited substantially. Comparable retention rates suggest that gamification supports durable learning across language contexts. Key moderating factors included cultural relevance of content, technical usability, and the integration of adaptive feedback mechanisms; addressing script-rendering challenges and incorporating culturally resonant narratives can further enhance efficacy for vernacular learners.

Beyond these core findings, several strategic implications emerge. First, educators should not merely adopt off-the-shelf gamified platforms but actively collaborate with developers to localize content—aligning game mechanics with regional idioms, festivals, and everyday practices—to maximize learner identification and intrinsic motivation. Second, developers must prioritize interoperability across devices and ensure seamless script support, particularly for non-Latin alphabets; iterative usability testing with target user groups is essential to identify and rectify rendering issues early in the design cycle. Third, policymakers and school administrators should consider allocating resources for teacher training programs that equip instructors with the pedagogical know-how to facilitate gamified sessions effectively, blending digital tasks with collaborative, classroom-based reflections that reinforce learning.

Looking ahead, adaptive gamification—leveraging AI to tailor difficulty, pacing, and narrative pathways to individual learner profiles—presents a promising frontier. Such systems can dynamically scaffold tasks, provide personalized feedback, and maintain optimal challenge levels, thereby sustaining engagement beyond initial novelty phases. Additionally, embedding social-collaborative features (e.g., team quests, peer-mentoring badges) could harness the motivational power of community, promoting cooperative learning and cross-linguistic peer support.

In summary, gamification offers a versatile, scalable approach to enriching language education in multilingual settings. By meticulously aligning game design with linguistic, cultural, and technological considerations, stakeholders can cultivate more engaging, effective, and inclusive learning experiences—ultimately advancing language proficiency, learner autonomy, and educational equity across diverse learner populations.

FUTURE SCOPE

1. **Longitudinal Studies:** Examine sustained impacts of gamification over semesters or academic years.
2. **Broader Linguistic Contexts:** Extend research to additional Indian languages (e.g., Tamil, Bengali) to generalize findings.
3. **Adaptive Gamification:** Investigate AI-driven personalization that adjusts difficulty and narrative paths based on learner profiles.

4. **Teacher Roles:** Explore how teacher facilitation of gamified activities influences outcomes.
5. **Cost–Benefit Analysis:** Assess economic feasibility of large-scale deployment in government schools.
6. **Social Gamification:** Evaluate peer-collaboration features (e.g., team-based quests) to further enhance motivation.

By advancing these research directions, stakeholders can harness gamification to its fullest potential, fostering inclusive, engaging, and effective language education across diverse learner populations.

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