Enhancing Reading Motivation and Engagement through Virtual Pet-Based Gamification

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Abstract: This study presents the design of a gamified reading support platform that combines virtual pet nurturing with AI-based analytics to address the challenge of sustaining students' reading motivation and long-term engagement. In the system, teachers provide guidance and feedback, students complete reading logs and discussion tasks to earn resources for caring for virtual pets, and parents contribute by supporting family reading activities. Reading activities are converted into in-game resources, with pets evolving in appearance as students progress. The platform integrates AI modules for learning diagnosis, emotion generation, growth visualization, and class-level analytics, together with gamification modules including quests, rewards, and progression loops. By fostering emotional connections and providing instant feedback, the system supports the development of stable reading habits, while offering educators and parents real-time data for tailored interventions. This work contributes a design case that bridges the theoretical foundations of Pet-like Learning Companion Systems (P-LCSs) with educational gamification, highlighting the role of affective interaction and cross-context continuity in promoting autonomous and lifelong learning.

Keywords: gamification, virtual pet nurturing, reading motivation, affective interaction, AI analytics

1. Background & Motivation

With the rapid development of educational technology, supporting students in developing consistent reading habits and sustaining long-term motivation has become a central challenge in educational practice (van der Sande et al., 2023). Previous studies have indicated that digital interventions, such as reading tasks, extracurricular participation, and teacher–student feedback, can significantly foster students' engagement in reading(Schneider et al., 2022). However, most existing digital reading platforms focus mainly on task- and knowledge-oriented support, with limited attention to long-term emotional attachment and responsibility.

The introduction of Learning Companion Systems (LCSs) (Chan T, 1990; Chou et al., 2003) opened new possibilities by simulating peer interactions to enhance students' motivation and learning. Unlike Intelligent Tutoring Systems, LCSs emphasize the role of peers, enabling students to engage in collaboration, competition, or teaching strategies that expand their learning experiences(Biswas et al., 2005; Chen et al., 2008). Nevertheless, these systems are often limited to short-term interactions, making it difficult to establish deep and enduring emotional connections.

More recently, LCSs have evolved into Pet-like Learning Companion Systems (P-LCSs), which emphasize the pet-owner relationship and emotional support. Such companionship fosters responsibility and self-regulation in pressure-free interactions(Chen et al., 2025). By nurturing virtual pets, students engage in planning, monitoring, and reflection, which align closely with the cyclic phases of self-regulated learning—planning, performance, and reflection(Chen et al., 2007; Schunk & Zimmerman, 1998).

In addition, P-LCSs are often integrated with gamified designs. Through the "nurturing–feedback–responsibility" cycle, learning behaviors can be transformed into long-term habits. When students complete learning tasks, virtual pets provide immediate affective feedback through expressions or behaviors, which enhances motivation and effort-making. In group settings, shared pet mechanisms foster collaboration, responsibility-sharing, and positive peer interaction. Moreover, quest- and competition-based designs have been shown to strengthen goal-setting and persistence.

Accordingly, this study proposes a "gamified reading support platform with virtual pet nurturing," grounded in the theoretical underpinnings of P-LCSs. By tightly linking reading activities with the growth and emotional states of virtual pets, the platform transforms learning tasks into nurturing experiences. Such a design not only sustains students' motivation across classroom, home, and digital contexts but also aims to foster the development of long-term and stable reading habits.

2. System Concept & Functional Architecture

The Reading Planet system is designed as a cloud-based web platform accessible on both desktop and mobile devices. Its core idea is for teachers, students, and parents to co-nurture a virtual pet through reading activities, creating a collaborative reading ecosystem. Students engage in daily reading and reflection, teachers provide instructional guidance, and parents reinforce learning at home. This tri-party collaboration transforms reading into a shared practice extending across classroom and family contexts.
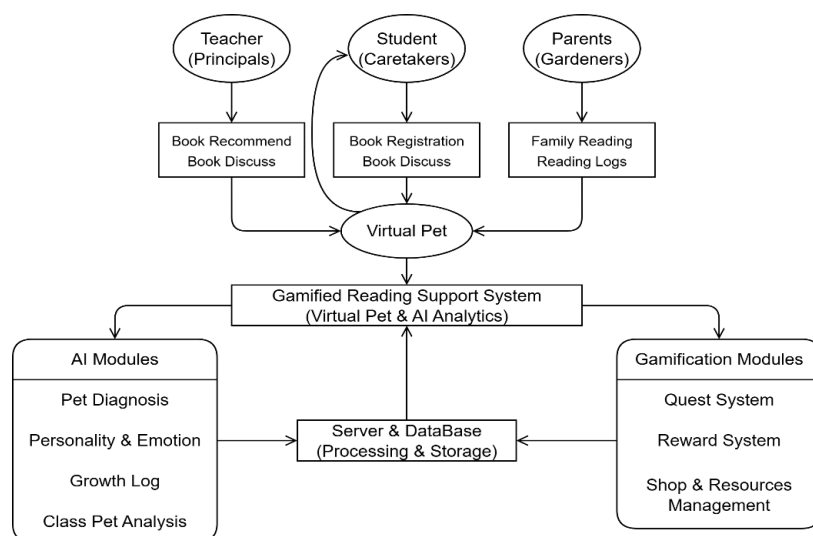

Figure 1. System architecture diagram

Functionally, the system integrates two key components: AI-driven intelligence and gamification mechanisms. On the AI side, the system analyzes reading logs, transcripts, and responses to identify comprehension patterns and engagement. It then generates empathetic emotional feedback through the virtual pet, providing personalized encouragement. The AI also maintains a visual growth record of each student's reading journey and offers a class-level dashboard to help teachers and parents monitor group progress and identify students needing support.

On the gamification side, the system uses a reward loop to sustain motivation. Students earn pet food, tools, and decorations by recording their reading activities, which can be exchanged for points, treasure chests, or badges. As participation continues, the pet upgrades and evolves, symbolizing student progress and reinforcing long-term engagement.

By combining intelligent analytics with playful design, Reading Planet demonstrates how AI can go beyond conventional gamified learning platforms, offering both meaningful feedback and sustained motivation.

3. Expected Contributions & Future Work

This study develops a gamified reading support platform with virtual pet nurturing, aiming to enhance students' reading motivation and sustained engagement through emotional connection and instant feedback. The seamless learning design enables students to shift smoothly between reading, reflection, and discussion across classroom, home, and digital contexts.

A key contribution lies in the AI-driven data analysis and transformation mechanism. Instead of merely recording reading logs, the system analyzes patterns of reading frequency, comprehension responses, and reflection depth to diagnose student engagement. These analyses are then transformed into meaningful feedback: the Pet Diagnosis module recommends prompts or follow-up reading tasks, while the Emotion & Personality module converts reading behaviors into adaptive pet reactions (e.g., excitement, encouragement, or concern). In this way, raw behavioral data becomes personalized, affective interaction, which distinguishes the platform from conventional gamified systems that focus only on points or badges.

In the educational and research domain, this work provides a design case that integrates virtual pets, AI analytics, and seamless learning, demonstrating how affective interaction can enhance reading motivation and learning outcomes. In the long term, the platform could be extended to other domains, supporting autonomous and lifelong learning.

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