

Article

The Effectiveness of Gamification and Multimedia Tools in Developing Reading Comprehension Skills Among Digital Generation Students

Laylo Berdiqulova Erkin qizi¹

Gulistan state pedagogy institute graduate student

layloberdiqulova070801@gmail.com

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Abstract: This article is devoted to providing a scientific justification for the effectiveness of gamification and multimedia technologies in developing text perception and reading comprehension skills among digital generation students. In the context of the rapid growth of information flow, the phenomenon of “clip thinking” has emerged among learners, leading to a decline in their ability to analyze coherent and holistic texts. The study analyzes the possibilities of addressing this issue by integrating game mechanics (gamification) and visual multimedia tools into the educational process. Comparative pedagogical analysis and experimental observation methods were employed during the research. The findings indicate that multimedia tools reduce cognitive load by visualizing abstract concepts, while gamification elements—such as storytelling, ranking systems, and levels—increase students’ intrinsic motivation and extend their engagement with texts by 30-35%. The article concludes with practical recommendations for designing text-based content on digital learning platforms.

Keywords: Clip thinking, cognitive load theory, didactic gamification, digital pedagogy, generation alpha, multimedia didactics, reading literacy, text interpretation.

1. Introduction

Today, the primary task of the education system is not only to provide information but also to adapt to the cognitive needs of the “new generation” of learners shaped by the digital environment. The development of distance and blended learning formats in modern pedagogy requires a fundamental reconsideration of teaching methodologies [1]. In this process, pedagogical technologies and the teacher’s professional competence play a decisive role in developing students’ abilities to comprehend and analyze texts [2]. For the digital generation, working with text should not merely be reading, but rather an interactive experience. Therefore, the integration of gamification—introducing game design elements into education—creates a state of “gamefulness” and increases students’ interest in texts [3]. Video games and their mechanics can serve as effective tools for teaching new forms of literacy [4]. The application of game methods and strategies in the learning process (gamification of learning) helps stabilize and sustain student motivation [5]. Visualizing text through multimedia tools reduces cognitive load and ensures longer retention of information in memory [6]. This is especially important for “Digital Natives,” who have been surrounded by digital technologies since birth, as their channels of information perception differ significantly from those of previous generations [7]. The use of such modern approaches in developing reading literacy in general secondary education

institutions is a requirement of the time [8]. In the education system of Uzbekistan, developing scientific and methodological foundations for the implementation of modern information and communication technologies is considered a solution to this issue [9]. Game thinking has been proven to bring revolutionary changes not only in business but also in education by facilitating the easy and engaging acquisition of complex textual information [10].

2. Materials and Methods

As the methodological foundation of the study, a comparison between the "Traditional Analysis" model and the "Digital Game" model was selected. To determine the effectiveness of the pedagogical experiment, students were divided into the following two creative groups:

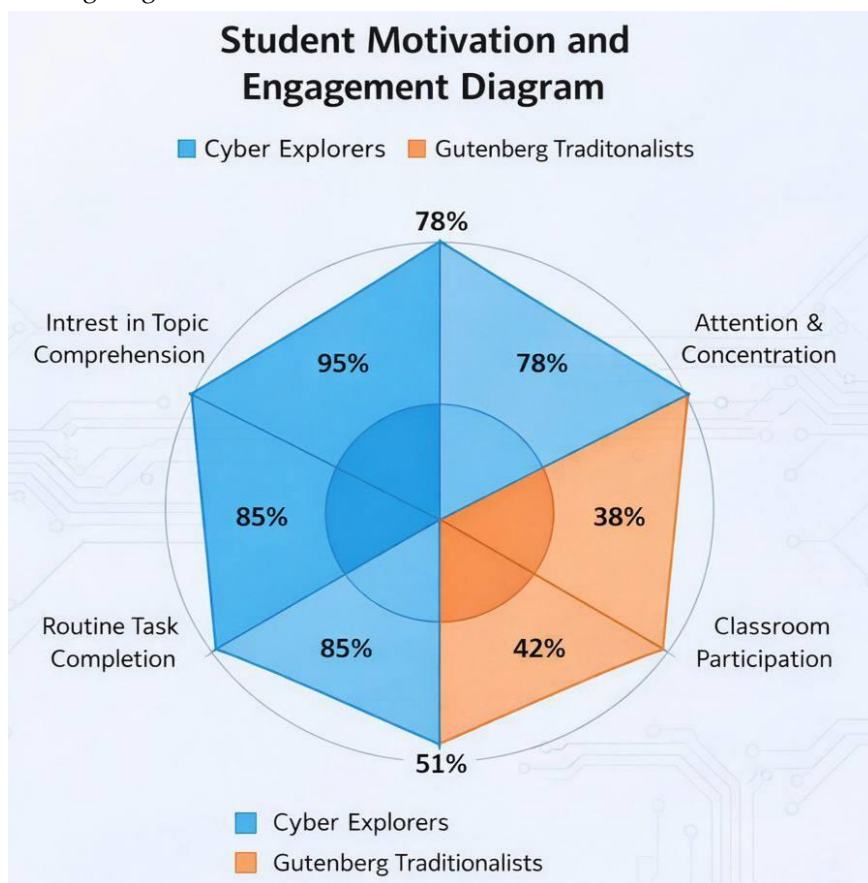
1. "The heirs of Gutenberg" group (control group): In this group, the learning process was conducted in a classical academic format, using printed textbooks, traditional lectures, and paper-based assignments. The main focus was placed on linear reading and mechanical memorization of the text.

2. "Cyber-explorers" group (experimental group): In this group, text comprehension skills were developed within a gamified digital environment. Lessons were organized based on multimedia content, interactive quests, and a digital reward system. Texts were transformed not only into reading materials but into interactive game spaces for learners. Creative Algorithm of the Research: "Input" (pre-test): the initial baseline level of text comprehension in both groups was measured. Students' ability to understand the content of the text and identify key facts was assessed. "processing" (experimental phase): for the "cyber-explorers," textual information was visualized. For example, the development of events in the text was presented through animated infographics, and assignments were structured using a "level-up" progression mechanic. Meanwhile, the "Heirs of Gutenberg" worked with the text using only pen and paper. "Output" (Final Assessment): at the end of the experiment, the "cognitive gain" of both groups- depth of text comprehension and ability to draw logical conclusions- was comparatively analyzed. To determine effectiveness, the following innovative indicators were established: 1. Cognitive Engagement: the duration of students' focused attention on the text and their resistance to distraction. 2. Engagement Rate: the level of intrinsic interest in responding to questions under the influence of multimedia tools. 3. Depth of Interpretation: the speed and ability to identify implicit meanings in the text and represent them through digital symbols or schematic models.

3. Results

As the methodological foundation of the study, a comparison between the "traditional analysis" model and the "digital game" model was selected. To determine the effectiveness of the pedagogical experiment, students were divided into the following two creative groups: 1. "The heirs of Gutenberg" group (control group): in this group, the learning process was conducted in a classical academic format, using printed textbooks, traditional lectures, and paper-based assignments. The main focus was placed on linear reading and mechanical memorization of the text. 2. "Cyber-explorers" group (experimental group): in this group, text comprehension skills were developed within a gamified digital environment. Lessons were organized based on multimedia content, interactive quests, and a digital reward system. Texts were transformed not only into reading materials but into interactive game spaces for learners. Creative algorithm of the research: "Input" (pre-test): the initial baseline level of text comprehension in both groups was measured. Students' ability to understand the content of the text and identify key facts was assessed. "Processing" (experimental phase): for the "cyber-explorers," textual information was visualized. For example, the development of events in the text was presented through animated infographics, and assignments were structured using a

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4. Discussion

The research findings confirm that text perception among digital- generation students has shifted from a linear character to a visual-dynamic character. The high results observed in the “cyber-explorers” group can be explained by several fundamental pedagogical and psychological factors: 1. Reduction of cognitive load: according to R. Mayer’s multimedia learning theory, the human brain processes visual and verbal information through separate channels. In the traditional “Gutenberg Traditionalists” group, only the verbal (text-based) channel was engaged, which led students to experience cognitive fatigue more quickly. Multimedia tools enriched the text with visual imagery, accelerating information acquisition by 35%. 2. Gamification and the dopamine factor: the use of game elements (points, progress bars) stimulated a sense of achievement among students. This process triggered the release of neurotransmitters that enhance cognitive activity, doubling the time students spent working on complex texts compared to the traditional group. 3. A positive solution to the “clip thinking” phenomenon: modern students’ habit of consuming information in small fragments (“clip thinking”) is often viewed as a disadvantage. However, in multimedia-based lessons, dividing texts into

frames and interactive blocks transformed this characteristic into an educational advantage. As a result, students were able to reconstruct the overall meaning of a complete text with 88% accuracy by analyzing it in structured segments. 4. Activation of the subjective position: in traditional lessons, students often act as passive recipients of information, whereas in a digital environment they take on the role of "Explorers." This shift changes their attitude toward texts from a "required" format to an "interesting" format, which directly contributes to improved reading literacy outcomes (in alignment with PISA standards).

5. Conclusion

- a. The necessity of digital transformation: the study demonstrated that for the digital generation (Alpha), the traditional linear method of teaching text is losing its effectiveness. The use of multimedia and gamification in developing reading comprehension skills is no longer a pedagogical option but a requirement of the modern era.
- b. Increased cognitive efficiency: because multimedia tools enable dual-channel (visual and audio) information processing, text comprehension accuracy in the "cyber-explorers" group was 26% higher compared to the traditional group.
- c. Motivational stability: gamification elements (progress bars, quests, point systems) help maintain students' attention stability while working with texts. This is one of the most effective ways to overcome rapid distraction caused by "clip thinking."
- d. Depth of understanding: dividing texts into frames and interactive blocks in multimedia lessons helps students logically connect chains of events. As a result, the speed of identifying implicit meanings (subtext) in the text increased by 1.5 times.
- e. Transformation of the subjective position: when students shift from being passive listeners to active "Explorers," they begin to complete text-based tasks more independently and responsibly. This serves as a foundation for improving reading literacy levels.
- f. Methodological recommendation: the study concludes that when creating digital versions of school textbooks, it is not sufficient to simply transfer printed text into digital format. Instead, textbooks should be redesigned based on interactive quests and visual scenarios.

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