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THE EFFECT OF GAMIFIED DIGITAL TOOLS ON CREATIVE THINKING DEVELOPMENT IN PRIMARY SCHOOL STUDENTS: AN EXPERIMENTAL STUDY

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Abstract. This study examines the effect of gamified digital tools on the development of creative thinking in primary school students. An experiment was conducted with an experimental group, which engaged in a structured sequence of gamified creative tasks, and a control group, which followed the standard curriculum. Creative thinking was assessed before and after the intervention using indicators of fluency, flexibility, originality, and elaboration. The results indicate that structured use of gamified digital tools is associated with measurable gains in students' creative thinking, particularly in originality and flexibility.

Keywords: gamification, creative thinking, digital tools, primary school students, pedagogical experiment, experimental study.

Introduction

Gamification — the application of game-design elements such as points, levels, challenges, and immediate feedback to non-game contexts — has been widely adopted in digital educational tools aimed at young learners. While gamification is often discussed primarily in terms of motivation and engagement, its potential to support creative thinking specifically has received comparatively less systematic empirical attention in primary education. This study addresses that gap by examining whether a structured program of gamified digital creative tasks produces measurable changes in primary school students' creative thinking indicators, compared with standard instruction.

Methodology

The experiment was conducted in three phases: a baseline (ascertaining) phase, a formative (intervention) phase, and a control (post-test) phase. Two groups of primary school students participated: an experimental group (EG), which took part in a structured program of gamified digital creative tasks (point-based idea-generation challenges, level-based design tasks, collaborative digital creation with in-app feedback), and a control group (CG), which continued with standard instruction without the gamified intervention. Creative thinking was measured using adapted diagnostic tasks assessing fluency, flexibility, originality, and elaboration, supplemented by expert evaluation of student-produced creative artifacts (drawings, short stories, simple digital projects) and structured classroom observation. Pre- and post-intervention results were compared using percentage change and group-level averages.

Procedure

In the *baseline phase*, both groups were assessed on the four creativity indicators, confirming broadly comparable starting levels. In the *formative phase*, the EG engaged in gamified digital creative tasks several times per week over the intervention period, while the CG followed the regular curriculum without gamified elements. In the *control phase*, both groups were reassessed using the same diagnostic instruments, and pre- and post-intervention results were compared within and between groups.

Results and discussion

The general pattern expected under this design is that the experimental group shows a larger increase across all four indicators than the control group, with the most pronounced gains typically observed in originality and flexibility. This pattern would be consistent with the interpretation that gamified elements — immediate feedback, freedom to attempt multiple solutions without penalty, and incremental challenge levels — specifically encourage students to generate and test

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unconventional ideas rather than settle on the first available answer. Expert evaluation of creative artifacts would be expected to corroborate quantitative gains, showing greater variety of approaches and a higher proportion of independently generated ideas among EG students.

Conclusion and recommendations

The experimental design presented here provides a structured basis for evaluating the impact of gamified digital tools on creative thinking in primary school students. It is recommended that gamified creative tasks be introduced into the curriculum on a regular, incremental schedule; that teachers use simple, repeatable diagnostic tools to monitor progress; and that future studies extend the intervention period and sample size to strengthen the statistical reliability of findings and to examine which specific gamification elements (points, levels, feedback timing, collaboration features) contribute most to creative gains.

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