DEVELOPING UNIVERSITY STUDENTS' CREATIVE ABILITIES THROUGH GAMIFICATION IN A DIGITAL LEARNING ENVIRONMENT

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Abstract. This extended thesis examines how carefully designed gamification can support university students' creative thinking in digital learning environments. Drawing on research in gamification, motivation and creativity assessment, it proposes a five-stage instructional cycle and a practical lesson scenario for teacher education. Three tables specify digital activities, assessment indicators and implementation risks; two conceptual figures visualize the approach. The contribution is methodological: the activities and rubric are proposed for future classroom validation, not presented as experimentally verified effects.

Keywords: gamification; creativity; digital learning environment; higher education; student autonomy; formative assessment; creative problem-solving.

INTRODUCTION

Digital environments offer access to interactive quizzes, collaborative whiteboards, multimedia production and online feedback. Their educational value, however, depends on what students actually do with these resources. Repeatedly answering closed questions may strengthen recall without necessarily improving originality, flexibility or the ability to develop useful solutions. A creativity-oriented design must therefore require students to frame problems, propose alternatives and reconsider their ideas in response to evidence [3].

Gamification refers to using game-design elements in non-game contexts [1]. Missions, progress indicators, optional pathways and constructive feedback may make participation meaningful, but points and competitive rankings alone are insufficient.

Empirical syntheses identify potential motivational and learning benefits while also showing variability across context and instructional design [2, 4]. This paper asks: how can gamification elements be organized so that students create and refine ideas rather than merely collect rewards?

PURPOSE AND METHOD

The purpose is to develop an implementable methodological framework for fostering creative abilities among university students through gamified digital tasks. The method is conceptual synthesis of selected peer-reviewed literature, design of a pedagogical cycle, and construction of an analytic rubric. No participants were recruited, no survey was administered and no quantitative effectiveness claims are made. The design may be tested in a future pedagogical experiment.

CONCEPTUAL FRAMEWORK

The proposed framework connects game mechanics with three learning processes: autonomy (students choose solution pathways), dialogue (students explain and compare ideas), and iteration (students improve an initial artifact). These mechanisms are compatible with self-determination theory, which emphasizes autonomy, competence and relatedness as relevant to motivation [5].

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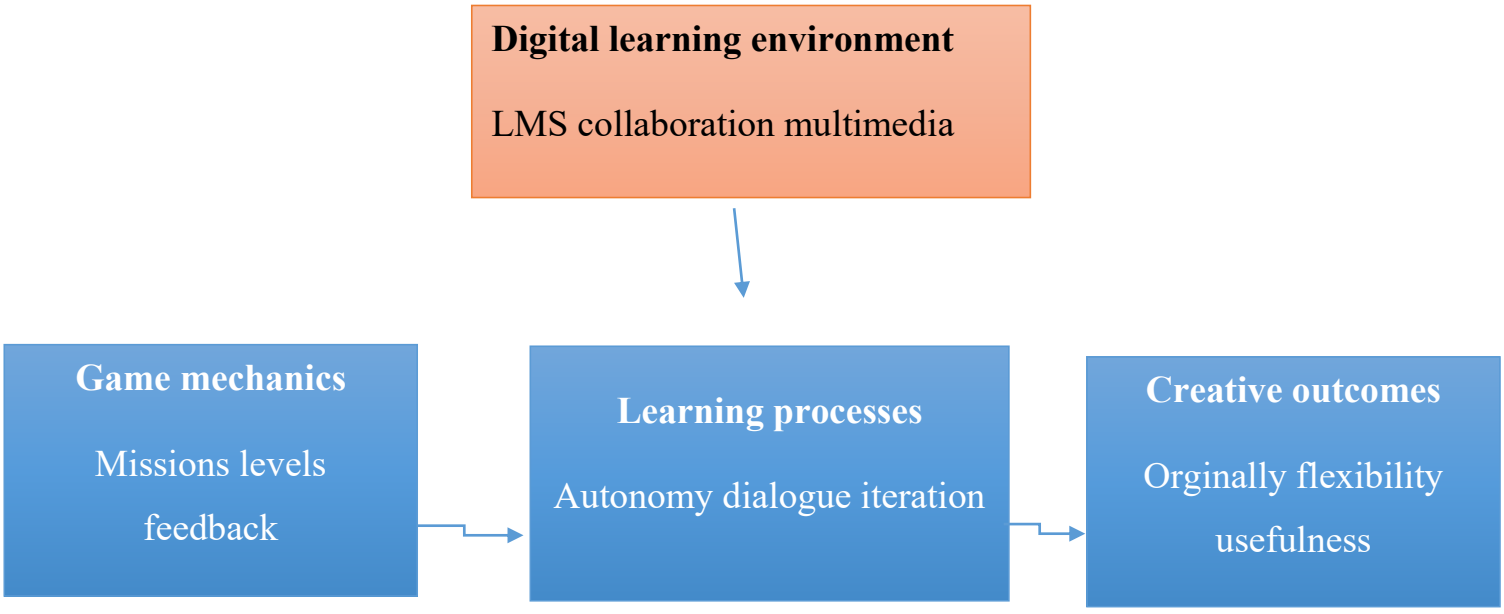


Figure 1. Proposed links between digital gamification, learning processes and creative outcomes (author-designed conceptual model).

Creative outcomes are operationalized as originality, flexibility, contextual usefulness and evidence-based revision. They are indicators to assess, not guaranteed consequences of any particular application.

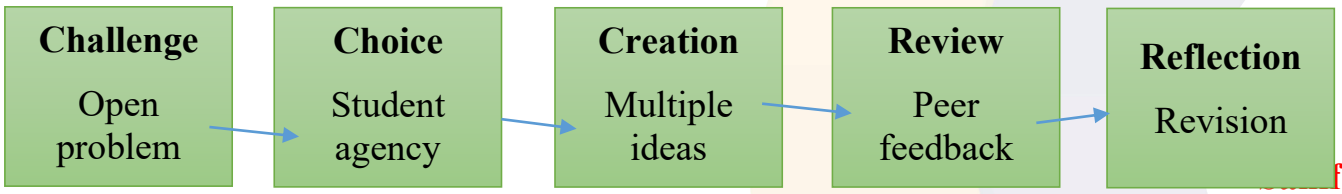
A FIVE-STAGE GAMIFIED LEARNING CYCLE

Table 1.

Pedagogical functions of the five stages.

Stage	Student activity	Game element	Observable product
Challenge	Interpret an open-ended real educational problem.	Mission brief and goal	Problem statement with constraints
Choice	Select tools, roles, audience and strategy.	Branching quests	Justified plan of action
Creation	Generate and combine multiple candidate solutions.	Milestones and progress map	Drafts, prototypes or lesson resources
Critical review	Compare ideas using shared criteria and peer comments.	Feedback checkpoint	Peer-review record
Reflection	Revise the selected artifact and explain changes.	Achievement for iteration	Final artifact and reflection log

The methodological sequence below gives game elements a distinct pedagogical purpose. Students are not rewarded simply for speed or participation; progress signals represent completion of creative processes, such as comparing alternative explanations or documenting substantive revisions.



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Figure 2. Five-stage cycle for a creativity-oriented gamified lesson (author-designed).

ILLUSTRATIVE TEACHER-EDUCATION ACTIVITY

Table 2.

Suggested schedule for one classroom session (illustrative, not field-tested).

Time	Phase and task	Evidence to collect
0–15 min	Mission briefing; define pupils' needs and success criteria.	One problem definition
15–30 min	Select roles, tool and at least two approaches.	Planning note and idea list
30–55 min	Develop three different explanations or prototypes.	Three draft alternatives
55–75 min	Peer review: explain strengths, limitations and learner fit.	Feedback with concrete suggestions
75–90 min	Revise preferred design; short individual reflection.	Revised artifact and rationale

A 90-minute workshop can use the mission "Explain an abstract concept to learners with different prior knowledge." Small teams prepare three markedly different solutions: for example, an analogy, an interactive problem and a short visual story. They decide which explanation best meets the needs of a specified group of pupils, then revise it after peer critique. A Moodle or Google Classroom space can host instructions and submissions; a shared board can collect competing ideas; a multimedia editor can support a prototype. These are examples of tool categories rather than an endorsement of particular vendors.

ASSESSMENT OF CREATIVE ABILITIES

A sound evaluation should distinguish creativity from mere engagement. An analytic rubric can be used on initial and revised products and accompanied by self-assessment and feedback records. Scores should be interpreted as classroom evidence of performance on the task, not as standardized measures of a stable trait. Instructors may use four descriptors emerging (1), developing (2), proficient (3) and advanced (4) for each dimension.

Indicator	Emerging (1)	Proficient (3)	Advanced (4)
Originality	Repeats a familiar example	Adapts a known approach with a new element	Provides a distinctive, justified idea
Flexibility	Offers one narrow solution	Offers different workable options	Switches perspectives and combines approaches
Usefulness	Weak fit with learner needs	Addresses the main task constraints	Addresses constraints and anticipates real use
Revision	Minor cosmetic changes	Responds to substantive feedback	Explains iterative decisions with evidence

Table 3. Illustrative analytic creativity rubric. A developing (2) performance falls between the emerging and proficient descriptors.

IMPLEMENTATION CONDITIONS AND LIMITATIONS

Three safeguards are important. First, learners should be able to choose between different formats so that limited access to a particular platform does not become a barrier to creativity. Second, feedback

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should privilege explanatory quality and revision rather than public ranking. Third, teachers should assess digital accessibility, privacy and the additional workload created by game elements. Competition may be motivating for some students yet discourage those who need time for exploratory thought. These considerations are reasons to treat gamification as a means rather than an educational goal.

This paper is limited by its conceptual approach. Neither the proposed lesson nor the rubric has been empirically validated in the author's setting. A future study could compare groups following gamified and non-gamified versions of the same open-ended task, assess baseline equivalence, use independent raters and report inter-rater agreement. Such a design would help test whether the model improves creativity beyond increasing short-term engagement.

CONCLUSION

Gamification is most relevant to creative development when its design directs students toward exploring alternatives, making choices, obtaining actionable feedback and revising original products. The proposed five-stage cycle integrates these processes with a transparent classroom rubric and an adaptable university teaching scenario. Its principal contribution is a structured pedagogical proposal suitable for subsequent empirical verification, rather than a claim that gamification automatically produces creativity.

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