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GAMIFICATION AND INTERACTIVE LEARNING: A SYNERGY FOR MOTIVATING 21ST-CENTURY LEARNERS

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The 21st century demands learners who are not just knowledgeable but also possess critical thinking, collaboration, and problem-solving skills. Traditional pedagogical methods often fall short in main training the engagement of the digital-native student.

In our article, we will explore the synergy between gamification – the application of game elements in an on-game context – and interactive learning to create powerful mechanism for enhancing student motivation and the effectiveness of the educational environment.

We will ascertain how the integration of elements such as points, badges, leaderboards, and collaborative challenges, combined with interactive tools, impacts key motivational factors, strengthens engagement, and fosters the essential digital competencies of the modern world.

Modern education is transforming and constantly facing challenges – digitalization, the transition to a hybrid learning format, and other factors are impacting the educational environment, making it increasingly difficult to satisfy the needs of the 21st-century learner.

Contemporary pupils and students feel comfortable when the environment is dynamic, provides immediate feedback/results, and encourages participation. All of this necessitates a shift from passive information consumption to active, experience-based learning (experiential learning). This transition is significantly powered by two key educational approaches: gamification and interactive learning.

In this article, we will explore the synergy between gamification and interactive learning to create a powerful mechanism for enhancing student

motivation and the effectiveness of the educational environment. We will ascertain how the integration of elements such as points, badges, leader boards, and collaborative challenges, combined with interactive tools, impacts key motivational factors, strengthens engagement, and fosters the essential digital competencies of the modern world.

Within the educational process at the PRIVATE GENERAL SECONDARY EDUCATION INSTITUTION "KHARKIV IT STEP SCHOOL LYCEUM KHARKIV" OF KHARKIV REGION, research on this scientific problem was conducted among students of grades 1–4 and 9–11. The study was carried out during lessons in both the Primary School and Senior School, specifically in the academic subjects "Fundamentals of Business" and "Entrepreneurship and Financial Literacy." The study examined the dynamics of motivation, engagement, and the development of digital competencies when applying gamification and interactive methods in these courses. The preliminary results confirmed the relevance and significance of combining these approaches for the formation of key 21st-century skills.

To consider this issue, we must rely on the Self-Determination Theory (SDT), which proves that gamification primarily activates in trinsic motivation by structuring learning activities in a way that satisfies three fundamental psychological needs: autonomy, competence, and relatedness (Deci & Ryan, 1985).

Let's examine each need in more detail:

1. Autonomy: Learners have the right to choose their “missions” or “stories”, “pathways”, or difficulty levels, which in turn increases their sense of control.

2. Competence: Various game elements, such as levels, points, and badges, provide immediate, tangible feedback on progress and mastery. This is important to implement in hybrid learning environments where physical presence is not always possible, as these elements provide awareness of progress regardless of the student's location.

3. Relatedness: Individual learning is transformed into a social and

collaborative activity through the implementation of leader boards or team quests, as this is how we can satisfy the need for belonging, which is quite difficult to maintain in an online format.

The interactive nature of the content (e.g., adaptive quizzes, VR simulations) serves as the delivery mechanism for these game mechanics, making skill acquisition an engaging and appealing process (Landers, 2014).

However, the gamified interactive environment contributes not only to motivation but also develops the necessary 21st-century skills – the 4Cs – and crucial digital competencies. These four skills originate from the Partnership for 21st Century Skills (P21) and comprise: Critical Thinking, Creativity, Collaboration, and Communication. In the context of our article, the4Cs are key learning outcomes, as the gamified interactive environment is ideally suited for their development. This is because quests and simulations stimulate critical thinking and creativity, while team missions and leaderboards foster collaboration and communication. Moreover, we shouldn't forget about digital competencies, as having basic skills in digital literacy and knowing how to handle technology is necessary to achieve truly visible results from learning and to advance these skills.

In the following table, we structure information about the skill categories, how they function (their mechanism), and why they are relevant in the modern educational environment:

Skill Category (4Cs & Digital)	Gamified Interactive Mechanism	Relevance to Modern Context
Critical Thinking	Complex Questsand Puzzles require applying knowledge to novel situations, encouraging trial-and-error in a low-stakes environment.	Essential for navigating the complexity and information overload of the digital world.
Creativity	Open-ended Simulations or Design Challenges (e.g., building digital artifacts) encourage students to develop novel and innovative approaches.	Crucial for adapting to rapid technological change and fostering innovation in future careers.

Collaboration & Communication	Team Quests or Cooperative Missions necessitate students to share resources, negotiate strategies, and effectively communicate to achieve a shared objective (Subhash & Cudney, 2018).	Vital for effective teamwork in remote and hybrid professional settings; promotes essential peer-to-peer digital communication.
Digital Competence	Utilizing specialized Gamified Learning Platforms (GLPs), interacting with digital interfaces, and mastering the tools required for game play and task submission.	Directly addresses the need for students to achieve digital literacy and comfort with the technological infrastructure of the modern economy ("Gamified Learning Platforms", 2024–2025).

Although the synergy of applying gamification and interactive methods is a powerful tool for boosting student motivation, we must understand that there are still challenges facing modern education. These include:

1. Quality and Focus: Poorly designed and simple gamification, such as awarding points for attendance, constitutes an easy extrinsic reward. This can be perceived as trivial and may undermine the process of long-term intrinsic motivation (Sailer & Homner, 2020).

2. Technological Equity (Digital Divide): Ideally, every learner should have stable internet, quality technical equipment, and access to sophisticated interactive tools. The disparity in technology access is exacerbated in hybrid settings – it poses a potential threat of widening the digital divide.

3. Instructor Competence: The effectiveness of the Gamified Learning Process (GLP) depends on the instructors' ability to move beyond old point systems and to develop meaningful, complex learning methodologies that align with pedagogical goals.

4. Dynamism and Renewal: To sustain students' long-term motivation, the learning environment should avoid repetitiveness and periodically update the content and difficulty level of tasks.

Conclusion. The combination of gamification and interactive learning is a factor that truly boosts the motivation of 21st-century learners, especially in the modern world where digitalization and hybrid delivery models have gained such

popularity due to contemporary challenges.

By leveraging all the advantages of these educational approaches, educators can transform the "OLD CLASSROOM" into a new educational environment where learning turns into an exciting adventure, and the passive consumer fin formation transforms into an active learner who is interested in and motivated for study. The future of education lies in strategically implementing this synergy to cultivate not just knowledge, but the essential cognitive and digital skills necessary for success in the modern, complex world. Analysis of the obtained results and correction of research methodologies will be the focus of further research.

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