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IMPROVING LEARNING THROUGH GAMIFICATION

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Abstract
The article discusses the issues related to potential of gamification for teaching military specialties. The specificity of military education differentiates it from other professions; therefore, teaching methods should be adapted. Having analyzed the main problems in implementation of gamification in military higher education through scaffolded progression systems, philosophy of iterative failure, social and collaborative layers, four activities were developed. Practical results demonstrated that motivation to learn and overall quality of developed skills were sufficiently improved within such activities.

Keywords: Military education, gamification, scaffolding, flow theory, learning autonomy.

Introduction

The traditional model of education, often characterized by passive listening, rote memorization, and high-stakes summative assessment, is increasingly misaligned with the needs of a generation raised on interactive digital media. In this landscape, the attention span is no longer a given; it must be earned. Gamification – the application of game-design elements and game principles in non-game contexts – has emerged as a potent pedagogical strategy to address this disconnect. Gamification in education has its roots in early computer-based learning games, including Oregon Trail, which effectively engaged learners through narrative and challenges. (Salen & Zimmerman, 2004) However, gamification is far more sophisticated than simply awarding badges for completing homework. To truly improve learning, gamification must transcend superficial pointification and evolve into a holistic framework that addresses motivation, cognitive development, and emotional resilience. Gamification is also based on *flow theory*, which states that leisure activities at work should provide a balance between challenge and skill. (Csikszentmihalyi, 1990) By strategically implementing progressive mastery systems, transforming the nature of failure, fostering social connectivity, and weaving compelling narratives, educators can create learning environments that are not merely engaging, but profoundly effective.

The first and most critical step in improving learning through gamification is shifting the focus from extrinsic rewards to intrinsic motivation via the framework of *progressive mastery and autonomy*. The most common pitfall in educational gamification is the over-reliance on a rewards loop – do X, get Y. While points, badges, and leaderboards (PBLs) can be effective onboarding tools, they often fail to sustain long-term engagement. When the reward becomes the goal, the learning itself is devalued; once the badge is collected, the motivation to revisit the material vanishes. “A classroom setting with a teacher in front at the blackboard/whiteboard

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and with students at their desks reading from a textbook, while still the norm in much of the world, is giving way to the practice of students working independently or collaboratively at computers and using other technology, such as cell phones (mobile phones) inside and outside of classrooms. The new discourse, which students use to author and post messages online, has features of both written and oral language, and students participate in online or virtual communities that have no borders". (Larsen-Freeman & Anderson: 251)

To improve learning, gamification must mirror the structure of well-designed video games, which excel at teaching complex systems through incremental challenge. This is achieved through the implementation of *scaffolded progression systems*. Instead of a linear syllabus, content can be organized into "skill trees" or "levels" where students must demonstrate mastery of prerequisite knowledge before unlocking advanced content. This transforms education from a one-size-fits-all timeline to a personalized journey. For example, a mathematics curriculum could be structured as a map where a student cannot access the "Calculus" region without first conquering the "Algebra Fortress." This structure provides immediate, clear feedback on progress. It replaces the vague goal of "doing well in school" with the concrete objective of "unlocking Level 4." This taps into the core psychological driver of competence; learners feel a sense of growth not because they received a sticker, but because they can tangibly see their own capability expanding.

Beyond structural changes, gamification fundamentally improves learning by *reframing the concept of failure*. In the high-stakes environment of traditional schooling, failure is a terminal event. A low grade on a midterm can permanently damage a GPA, fostering fear and risk-averse behavior. Students learn to play it safe, memorizing just enough to pass rather than experimenting with ideas. In contrast, games treat failure as data. Losing a boss fight in *Dark Souls* or failing a platform jump in *Super Mario* does not end the game; it provides critical feedback on timing and strategy.

To improve learning, gamified systems must adopt this philosophy of *iterative failure*. This can be achieved by redesigning assessment to be low-stakes and high-frequency. Instead of a single, high-pressure exam, courses can utilize "mastery quizzes" that students can retake multiple times. The objective shifts from achieving a perfect score on the first attempt to demonstrating eventual competence. Furthermore, gamification introduces the concept of "safe-fail" environments. Simulation-based learning, such as business management games or virtual science labs, allows students to test hypotheses and witness the consequences of their decisions without real-world repercussions. A business student can bankrupt a simulated company, analyze the quarterly reports to see why, and restart with a new strategy. This process builds analytical thinking and resilience. When students understand that failure is merely a checkpoint in the learning process rather than a final judgment, they are more likely to engage in deep, exploratory learning and develop a growth mindset.

Another critical dimension often overlooked in educational gamification is the *social and collaborative layer*. Early gamification models frequently focused on individual achievement and competitive leaderboards. While competition can motivate a few, it often demoralizes the majority who never reach the top. To improve learning for a broad population, gamification must pivot from hyper-competition to *cooperative and guild-based structures*.

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Video games have long demonstrated that the most enduring engagement comes from social contracts and shared goals. Applying this to education involves creating opportunities for "co-op" learning. Rather than students competing for the top spot on a leaderboard, they could be organized into "guilds" or houses that work together to achieve collective objectives. For instance, a history class could be divided into ancient civilizations, with each guild earning points based on the sum total of all members' quiz scores or project completions. This structure leverages social accountability; students are motivated not just by personal gain, but by a sense of duty to their peers. It encourages high-performing students to tutor struggling classmates, transforming knowledge sharing from a form of cheating into a valuable strategy. This shift from a zero-sum game (where one person's win is another's loss) to a positive-sum game fosters a classroom culture of collaboration, empathy, and collective intelligence.

Finally, the most immersive and effective form of gamification involves the integration of *narrative and role-playing*. Humans are wired for stories. Yet, traditional curricula often present knowledge as a disconnected series of facts. Gamification improves learning by providing *contextual meaning* through storytelling. When a student understands *why* they need to know something within the context of a story, the information becomes sticky.

This technique, known as narrative gamification, transforms a lesson plan into a plotline. A cybersecurity course need not be a list of firewall configurations; it can be framed as an operation to defend a network from a hostile hacker group. Students are not just students; they are analysts. "Knowledge involves two strongly inter-linked but different components: content and skills. Content includes facts, ideas, principles, evidence, and descriptions of processes or procedures. Most instructors, at least in universities, are well trained in content and have a deep understanding of the subject areas in which they are teaching. Expertise in skills development though is another matter. The issue here is not so much that instructors do not help students develop skills – they do – but whether these intellectual skills match the needs of knowledge-based workers, and whether enough emphasis is given to skills development within the curriculum." (Bates, 2015:17) The task is not just to write an essay; it is to compile a dossier on a corporate spy. This narrative framing serves a crucial neurological function: it activates the brain's dopaminergic pathways associated with curiosity and anticipation. It creates an emotional stake in the outcome. Furthermore, allowing students to adopt roles or personas can reduce the anxiety associated with personal performance. A shy student may be more willing to participate in a debate if they are arguing from the perspective of a character they have created. By cloaking academic content in the guise of a quest or mission, educators bridge the gap between the abstract and the tangible, making the curriculum feel relevant and urgent.

Gamification principles can be applied in any classroom. We attempted to develop activities for military students. "Since the early 21st century, global dynamics in the military sphere have fundamentally altered the demands on language and culture. Military personnel are now required not only to master traditional military knowledge but also to excel in multicultural and multilingual communication". (Galeotti, 2022) Meanwhile, communicative skills cannot be developed without practice in real-life situations and "rote learning – taking in isolated bits and pieces of information that arc not connected with one's existing cognitive structures – has little

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chance of creating long-term retention" (Brown, 2000:57), so the activities we suggest are based on this principle.

Activity 1. The joint operations "Ender's Game" simulator

The core principle of this activity lies within a real-time strategic decision-making and command under information asymmetry as military higher education often teaches joint operations (Army, Navy, Air Force, Space Force) in separate silos before combining them. This activity forces true joint interdependence. During this activity, students (cadets) are divided into "Joint Task Force" teams. The classroom is set up as a Combined Air Operations Center (CAOC) or a Fleet Command Center. A large digital map is projected, displaying a real-time scenario (e.g., a humanitarian crisis escalating into a near-peer conflict). However, no single student sees the whole picture. Each service representative receives data specific to their domain, but that data is delayed or degraded. The Naval officer sees the surface threats; the Air Force officer sees weather windows and CAP stations; the Army officer sees ground troop movements; the Cyber officer sees network intrusions. Each team has a limited budget of "Influence Points" or "Operational Tokens" to spend on reconnaissance, strikes, or humanitarian aid. Rounds are timed (e.g., 5 minutes per "tactical decision"). If a decision isn't made in time, the enemy AI advances. As the scenario progresses and students prove their competence, they "unlock" higher-end assets (e.g., moving from unarmed drones to stealth fighters). This gamifies the friction of joint command. Students learn that waiting for perfect intelligence leads to defeat, and that trust in joint partners is an operational requirement, not a courtesy.

Activity 2. "Quartermaster Crisis": Logistics & Procurement survival

Logistics is often viewed as the "boring" side of military education. The core principle of this activity is to supply chain management, risk assessment, and the consequences of administrative failure. This game makes logistics a high-stakes, visceral challenge. Students are appointed as Battalion Supply Officers or Defense Procurement Executives. They are given a scenario: a division must be deployed to a remote location in 72 hours. Students must source supplies from a list of contractors. However, the lowest bidder might have a hidden "corruption" stat or a history of late deliveries. Students roll a dice or draw a card to reveal the actual reliability of the vendor *after* they sign the contract. Vehicles and equipment on the digital map have a health bar. If students neglect scheduled maintenance to save time, the health bar depletes, resulting in breakdowns at the worst possible moment. As a pressure tactic, the instructor presents an illegal or unethical shortcut (e.g., "A local broker can get you the fuel immediately, no paperwork, but it's of unknown origin"). Students can take the risk for immediate gain, but risk facing a Court of Inquiry later in the simulation. As a result, students experience the "tyranny of the urgent". They learn that logistics failures (lack of fuel, broken trucks) are not administrative footnotes; they are combat multipliers for the enemy.

Activity 3. Strategic narrative: The "Ghost Protocol" alternate history

Strategy is largely about predicting adversary behavior. This activity uses role-playing to explore deterrence and escalation through geopolitical analysis, deterrence theory, and the

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power of narrative. The class is split into five "Cabinet Rooms" representing different nations (e.g., US, China, Russia, a rising regional power, and a non-state actor). A crisis erupts (e.g., a disputed island chain or a cyber-attack on critical infrastructure). Each country team has a hidden "Domestic Approval" meter and a visible "International Credibility" meter. Aggressive moves might please the domestic audience but trigger sanctions (lowering the economy score) from the international community. Students must write classified strategy memos. However, the instructor randomly selects one memo per round to be "leaked to the press". The student must then publicly defend their strategy, even if it was aggressive or controversial. This is not a one-off debate. Decisions made in Week 1 (e.g., stationing a carrier group) affect the "threat assessment" data the team receives in Week 4. Students learn that in the real world, you cannot "save scum" (reload a previous save file). Strategic narratives have momentum. This gamifies the concept of unintended consequences and the difficulty of de-escalation.

Activity 4. "Duty & Honor": The Ethical Dilemma Ladder

Ethics training is often theoretical. This activity gamifies the emotional pressure of ethical decision-making, so the main principle of this activity is underpinned by military ethics, moral courage, and legal compliance (Law of Armed Conflict). Students are placed in a branching narrative "Choose Your Own Adventure" style game, but played out in a live classroom setting. A student is randomly selected to be the Commander on the ground. They are presented with an ambiguous situation (e.g., a compound contains a high-value target, but civilians are present). The student has 60 seconds to decide: Call in the strike, risk troops to clear the building, or withdraw. The choice triggers a specific video clip or a casualty report read aloud by the instructor. The student sees the immediate, visceral outcome of their order (simulated casualties, collateral damage, or successful capture). After the decision, the class votes anonymously on whether the action was "Tactically Sound" and "Morally Just". The Commander receives the aggregated scores. As the game progresses, students accumulate "Fatigue". A fatigued commander is statistically more likely to make aggressive or reckless decisions in the simulation, mirroring the real-world effects of combat stress. As a result, students move from knowing the *Robbins Rules* or *Geneva Conventions* intellectually to feeling the weight of applying them in a "gray zone" scenario with the clock ticking.

Conclusion

Summarizing, the path to improving learning through gamification is not paved with glittering badges and superficial points. That is merely the veneer of gamification. The true power lies in the deep structural logic of games. By architecting curricula that function like skill trees, we foster autonomy and mastery. By redesigning assessment to embrace iterative failure, we cultivate resilience and analytical rigor. By emphasizing cooperative guilds over competitive leaderboards, we build communities of shared intellectual growth. And by weaving cold facts into warm narratives, we make knowledge unforgettable. "Modern education strives for active learning, where students are at the forefront of the educational process and acquire their skills and competencies. But translating this idea into reality faces many challenges, including infrastructure and limited resources. Despite this, modern information technologies, especially

distance learning, create enormous opportunities to implement this concept, where the teacher takes on the role of a mentor who helps develop students' motivation for learning and stimulates their independent learning activities." (Arustamyan & Aripova, 2025:26) When implemented with pedagogical intentionality, gamification does not make learning "easy" or turn education into mere play. Instead, it makes the hard work of learning feel meaningful, the frustration of struggle feels productive, and the accomplishment of mastery feel profoundly personal. It transforms the classroom from a theater of performance into a workshop for growth. For a military higher institution, gamification must feel like a wargame, not a grade school chart. These four activities leverage stress, incomplete information, resource scarcity, and ethical weight – the true realities of the profession. They transform cadets and officers from passive recipients of doctrine into active problem-solvers who are psychologically and intellectually prepared for the ambiguity of modern conflict.

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