

## Gamified Learning Pathways for Prison Education: Rehabilitation Outcomes among Young Prisoners.

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### Abstract

Youth in correctional facilities today constitute one of the most under-resourced demographics in educational settings, as conventional pedagogies persistently fail to address the intersecting challenges of trauma exposure, motivational disengagement, and digital disaffiliation, which continue to remain widely prevalent in carceral learning environments. This study seeks to examine the potential of gamified learning pathways in carceral education, using Self-Determination Theory (SDT), Good Lives Model (GLM), and Critical Theory Approach (CTA) to study the influence of these interventions on the post-release rehabilitation outcomes of young inmates. Three hypotheses are tested: SDT-aligned gamification mechanics can positively impact motivational engagement and socio-emotional well-being (H1); ICT-enabled gamified learning interventions can positively affect digital literacy acquisition (H2); and structured gamified pathways can positively affect post-release social reintegration and employment outcomes (H3). A sequential mixed-methods design was adopted, involving a systematic literature review (SLR) using the PRISMA guidelines in Scopus and Web of Science for RQ1 and a constructivist qualitative multiple case study approach for RQ2 and RQ3, which integrates findings from six correctional contexts including Ecuador, Greece, United Kingdom, Catalonia, South Africa, and the United States. Results validate the findings suggesting that the dimensions of competence, autonomy, relatedness collectively result in improved learner engagement and well-being. Cross-case synthesis further confirms that gamified learning mechanisms facilitate identity reconstruction, extend vocational delivery, and catalyze long-term reintegration. All three hypotheses are supported empirically, making gamification a policy-ready rehabilitative tool in correctional education.

**Keywords:** Gamified learning, prison education, juvenile rehabilitation, Self-Determination Theory, digital literacy, post-release reintegration, correctional education, Good Lives Model..

### Introduction

The purview of correctional facilities today extends far beyond its previous mandate of creating a secure living environment for inmates. Across the world, criminal justice systems have shifted their focus from punishment and retribution towards promoting long-term desistance and addressing the underlying causes of reoffending. This transition to a restorative carceral model has prompted correctional institutions to adopt a range of strategies that support the successful reintegration of individuals into society (Road to Freedom, n.d.). The role of education in achieving reintegration is unequivocal. Education has long been codified as an irrevocable right by multilateral institutions (UNESCO). In constraint-bound settings such as prisons, the purpose of education extends beyond skill acquisition and workforce readiness, as it contributes to socio-emotional development, identity reconstruction, and the transformation of a prisoner's "life project" (Quinde et al., 2018). Although strong empirical links have been established between prison education and lower recidivism rates, its restorative potential remains constrained by persistent structural barriers (Kim et al., 2025). The primary challenge with most prison education programs is that they attempt to replicate conventional instructional methods in prisons, which neglects the unique constraints of carceral environments and the distinct psychological profiles of incarcerated youth. Incarcerated individuals generally have low levels of intrinsic motivation and are largely disengaged in the educational process. Therefore, pedagogical interventions should move beyond merely delivering educational content and focus on creating a framework that bolsters engagement by increasing learner agency, encouraging self-direction, and valuing their life experiences. (Conway, 2022). Educational theories in andragogy and socio-constructivism offer valuable insights into adopting a learner-centric approach. Andragogical principles emphasize learner agency in structuring syllabi, activities, and evaluation methods, emphasizing the importance of counteracting the restrictive dynamics of prison environments (Zainuddin et al., 2024). Similarly, socio-constructivist models of learning such as Socially Shared Regulation of Learning (SSRL) prioritize mutual goal setting, joint monitoring and collaborative reflection, which promotes learner autonomy and creates opportunities for positive interpersonal interactions. (Kim et al., 2025). While these models can theoretically be deployed in prisons, their effectiveness depends on relational trust and environmental flexibility, both of which remain conspicuously absent in carceral settings.

Recent advances in technology have fundamentally transformed the educational landscape within correctional institutions (Imandeka et al., 2024). Smart prison programs increasingly utilize AI-driven predictive algorithms and Virtual Reality simulations to create a dynamic, responsive and equitable learning experience for populations with varying educational levels and socio-emotional profiles (Sousa et al., 2025). These technologies can also be used to curate personalized interventions and cater to the specific pedagogical needs of incarcerated learners, aligning with the principles of Education 5.0. Beyond individualized learning, Virtual Reality simulations create environments where individuals can rehearse social interactions and practice anger management, allowing them to develop prosocial behaviour and improve interpersonal competencies (Tj & Kumar, 2024). Gamification leverages these technologies and emerges as a promising pedagogical intervention, considering that it can sustain learner engagement while remaining adaptable to prisons across geographic contexts. Gamification refers to adapting game design elements in non-game contexts. It involves incorporating game design elements such as points, badges, leaderboards and feedback mechanisms and novel mechanics such as iterative design and storytelling into educational curricula, with the overarching objective of creating a user-centric and incentive-driven learning journey (Khoshnoodifar et al., 2023). Gamified systems employ structured reward systems to encourage more ambitious goal-setting and long-term motivational engagement in the learning process (Elsawah, 2025).



**Figure 1: Motivation for Learning through Gamification in Prison Education**

Figure 1 illustrates six components: self-directed learning, intrinsic motivation, goal orientation, competence building, feedback loops, and social relatedness that are necessary to sustain motivation among incarcerated individuals. Gamified interventions sustain learner motivation by using several interrelated mechanics to fulfill these characteristics. For example, progression bars and reward systems serve as signals of competence and improve prisoner goal orientation, while personalized learning builds intrinsic motivation through self-directed learning. Sustaining learner motivation is particularly important for young prisoners, as they have higher reoffending rates as compared to other demographics, and experience severe motivational deficits owing to their underdeveloped socio-emotional capacities and limited exposure to literacy. (Tj & Kumar, 2024). Given the persistent inadequacy of rehabilitation outcomes in conventional prison education systems, this study is guided by five purposefully sequenced research objectives. Firstly, this study aims to explore the influence of structured gamification mechanics such as points, badges, leaderboards, and skill-based micro-leagues on the motivational engagement of incarcerated youth. Next, this study seeks to examine the effectiveness of game mechanics aligned with the core tenets of Self Determination Theory (autonomy, competence and relatedness). This research also evaluated the role of educational interventions that are integrated with Information and Communication Technology (ICT) systems, placing special emphasis on their contribution towards improving digital literacy and catalyzing broader behavioral transformation. Furthermore, this study assesses the impact of gamified interventions on post-release employment opportunities and social reintegration prospects, an area which remains critically underexplored in existing literature. Finally, this study analyses how factors such as varying psychological characteristics, prior educational attainment, and access to digital infrastructure influence the relationship between gamified learning pathways and rehabilitation outcomes. Through these objectives, this research seeks to develop a more nuanced understanding of how gamification can strengthen carceral education and support successful social reintegration.

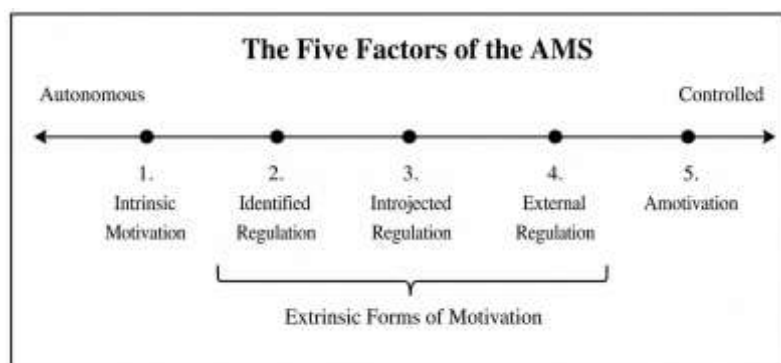
This paper includes the following sections: a review of related studies Section 2, a description of research methodology using PRISMA modeling and case studies in Section 3, the results of the study in Section 4, and a discussion of potential directions for further research in Section 5.

## II. LITERATURE REVIEW

Self-Determination Theory provides theoretical support for using gamification as a pedagogical intervention in carceral settings. SDT posits that optimal human functioning, and psychological health is reliant on the satisfaction of three innate needs: autonomy, competence, and relatedness (Elsawah, 2025b). These parameters are particularly salient in carceral education. Allowing learners to maintain autonomy over the learning process through self-directed learning helps them counteract institutional dependency and enables them to exercise agency over the trajectory and pace of their learning (Deci et al., 2000). Similarly, building perceptions of competence among incarcerated individuals cultivates a sense of achievement, which encourages them to take incremental actions that ultimately translate into further progress, overshadowing their previously fractured educational histories. Relatedness also plays a crucial role in improving interpersonal skills among inmates and fostering prosocial behaviour post-release. Therefore, gamified interventions must be designed to operationalize autonomy, competence and relatedness in order to effectively compensate for motivational deficits among incarcerated individuals (Madoc-Jones, 2019). Designing gamified interventions that optimize the three tenets of SDT, and by extension, the motivation of incarcerated individuals remains a sparsely explored area and can be especially challenging considering the interplay of factors which contribute towards sustaining learner motivation. Thus, interventions must be designed around a single unifying principle, allowing them to produce a cumulative effect by reinforcing the same motivational construct. Collectively employing mechanisms such as points and badges, adaptive difficulty and milestone recognition, and leaderboards constitute a uniquely potent combination as these mechanisms embody the same underlying principle of self-directed learning, which itself has robust theoretical grounding in andrological principles (Youssef, 2024). Although the overarching objective of promoting a user-centric model of learning is exemplified across these mechanisms, each of them possess certain exclusive advantages. For example, points and badges provide immediate and quantifiable validation, functioning as dopaminergic feedback loops. This is particularly relevant in carceral settings as traditional forms of external validation, such as status markers and career milestones, remain largely absent. Concurrently, adaptive difficulty and milestone recognition reduce the affective distance between incarcerated learners and their educational goals, while leaderboards leverage social comparison bias to stimulate learner participation (Elsawah, 2025b). Cumulatively, these mechanisms act simultaneously and synchronistically, effectively sustaining the motivational parameters of autonomy, competence and relatedness.

While gamified interventions addressing the core dimensions of autonomy, competence and relatedness are broadly applicable and implementable across all prison demographics, distinguishing between motivational profiles demographically may yield more personalized interventions. Considering that this paper predominantly focuses on young prisoners, using age as a differentiating factor is useful to distinguish between the motivational profiles of young and old prisoners. The Academic Motivation Scale (AMS) provides a useful framework to analyze and evaluate these profiles by categorizing motivation along a five-factor continuum ranging from autonomous to controlled motivation (Manger et al., 2020).

Figure 2 depicts a visual representation of the five factors of the Academic Motivation Scale (AMS): intrinsic motivation, identified regulation, introjected regulation, external regulation, and amotivation. In the context of carceral education, intrinsic motivation refers to voluntary participation in the learning process for the satisfaction and inherent enjoyment of the activity itself. Although identified regulation, introjected regulation and external regulation comprise extrinsic motivation, they have subtle differences in the degree to which motivation has been internalized. Identified regulation is a relatively autonomous form of motivation, whereby individuals engage in an activity after themselves identifying its value or utility. Contrastingly, introduction and external regulation are more controlled forms of motivation, as individual behaviour is driven by internal pressures such as guilt or shame, or by external forces such as rewards or punishments. Various studies in the area have observed relationships between age and the motivational profiles of individuals. Specifically, studies have identified a negative correlation between age and the three extrinsic forms of motivation and a positive correlation between age and intrinsic motivation (Manger et al., 2020). This implies that young prisoners are likely to respond positively to gamified interventions that target extrinsic motivation, underscoring the utility of adopting a gamified model that provides structured external incentives to address the developmental needs of the incarcerated youth.



**Figure 2: The Five Factors of the Academic Motivation Scale (AMS)**

However, it remains essential to recognize that a designing pedagogical system that relies exclusively on extrinsic incentives, rewards and pressures may diminish the restorative potential of gamified education. Motivation for education among prisoners is driven by the interaction of intrinsic factors such as the innate desire to learn with extrinsic factors such as future job prospects. Considering that these factors are not mutually exclusive or antagonistic in nature, neglecting intrinsic aspects restricts the potential of gamified interventions in correcting motivational deficits among incarcerated youth. Furthermore, excessive extrinsic elements can trigger gamification fatigue and “zombification”, whereby superficial engagement with game mechanics causes demotivation, apathy and burnout (S. Conway, 2014). These phenomena can also be explained using the over justification effect, as hyper fixating on rewards and mechanical accumulation of rewards takes precedence over genuine learning, inadvertently crowding out the learner’s intrinsic interest in subject matter over time. While certain gamification mechanics such as leaderboards were designed with the intention of stimulating learner participation through social comparison bias, significant drop-offs in leaderboard placement can contribute to negative social comparison, catalyzing gamification fatigue among participants (Elsawah, 2025b). To strategically mitigate gamification fatigue and maximize the efficacy of gamified interventions, a multifaceted approach that synthesizes extrinsic rewards mechanisms with user-centric mechanics can be adopted (S. Conway, 2014). Specifically, replacing organisations-centric instructional approaches, where evaluative standards and benchmarks for success are defined by prison administration, with bottom-up frameworks that allow learners to exercise agency over their own learning trajectories facilitates personal growth and improves intrinsic motivation. Another useful adaptation is introducing balanced competition by inculcating skill-based micro-leagues and best personal systems within gamified environments. These mechanisms greatly reduce the likelihood of cognitive withdrawal by overcoming the challenges posed by negative social comparison in conventional leaderboards. Moreover, considering the distinct social, cultural, geographic, demographic, and motivational profiles of each participant and curating inclusive, context-sensitive learning pedagogies enables hyperpersonalisation in the learning process. As opposed to relying solely on extrinsic reward mechanisms, this synergistic approach makes learning inherently meaningful and allows gamification to reach its complete, radical potential.

Figure 3 conceptualizes a synergistic approach to gamified education, illustrating its role as a structurally enabling factor for rehabilitation and reintegration by initiating identity transformation in young offenders. Within rehabilitation theory, identity transformation refers to the process by which an individual undergoes a cognitive shift, moving away from an internalized criminal identity toward a prosocial narrative (Badejo, 2024). Reward-response mechanisms used in gamified pathways are instrumental for identity transformation, specifically for prisoners with histories of trauma, allowing them to overcome learned helplessness and gain a sense of self-efficacy, which serves as a vital precursor to successful rehabilitation. Furthermore, embedding information and communication technologies (ICT) in carceral education allow incarcerated learners to acquire skills aligned with the demands of the contemporary labor market while maintaining meaningful social connections with family members (Mahlangu & Zivanai, 2023). These experiences reinforce relational roles such as student, worker, and family member that these individuals hold outside the prison environment, thereby supporting the construction of prosocial identities (Giannoulis et al., 2022). Additionally, an integral tenet of identity transformation is strengthening specific cognitive competencies such as self-awareness and emotional regulation. As individuals gain the sociocognitive awareness and learn to interpret situations objectively, they recognize that their responses to events, rather than the events themselves, produce unfavorable behavioral outcomes such as anger and distress. This encourages a broader behavioral transition as individuals make conscious decisions as opposed to reactionary ones, leading to the adoption of prosocial behaviour (Skiba, 2020). Therefore, the scope of gamified interventions extends beyond simply improving educational engagement, as it enables an identity transformation that is essential for rehabilitation and long-term societal reintegration

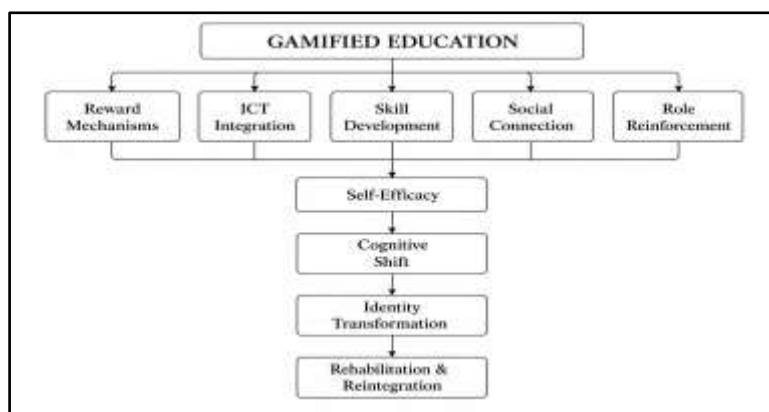


Figure 3: Conceptual Pathway from Gamification to Rehabilitation and Reintegration

. TABLE I. POLICY IMPLICATIONS OF GAMIFICATION FOR PRISON INMATE LEARNING OUTCOMES

| Tier                              | Focus Area              | Policy Implications                                                                                                                                                                                                |
|-----------------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tier 1<br>Institutional Policy    | Institutional Policy    | 1. Mandate gamification standards in prison education frameworks.<br>2. Integrate trauma-informed design protocols into procurement criteria.                                                                      |
| Tier 2<br>Curriculum and Pedagogy | Curriculum and Pedagogy | 3. Commission modular, literacy-adaptive gamified curricula co-designed with forensic educators and psychologists.<br>4. Embed desistance-aligned narrative progression within game mechanics.                     |
| Tier 3<br>Governance and Evidence | Governance and Evidence | 5. Establish national longitudinal outcome registries linking gamified programme participation to recidivism and employment metrics.<br>6. Fund randomised controlled trials with 24-month post-release follow-up. |

Table I depicts a multi-tiered policy framework for implementing gamified learning pathways within prison education systems. At the institutional level, the framework supports the establishment of minimum national standards for gamified interventions and the inclusion of trauma-informed design principles into the procurement process. At the curricular level, this framework emphasizes creating structured curricula with adaptive pathways that can be calibrated to levels of literacy and prior educational attainment, which is extremely salient considering that a mere 16.2% of prisoners in India had been provided with any form of educational opportunity (Mohan, 2023). Alongside designing modular curricular, the integration of desistance- aligned narrative progression helps reinforce prosocial identity formation among incarcerated individuals. Finally, at the governance level, the framework highlights the importance of comprehensive evidence generation through longitudinal outcome registries linking programmed participation to post-release indicators such as recidivism and employment, as well as the funding of long-term randomized controlled trials (RCTs). Collectively, these policy recommendations emphasize the need for coordinated policy action to maximize the rehabilitative potential of gamified prison education.

### Research Questions

RQ1 - How do SDT-aligned gamification mechanics influence the motivational engagement and socio-emotional well-being of young prisoners across varying psychological profiles?

RQ2 - To what extent does ICT-enabled gamified learning contribute to digital literacy acquisition, and how do institutional access barriers moderate rehabilitation outcomes among incarcerated youth?



RQ3 - In what ways do gamify pathway designs influence the post-release employment prospects and societal reintegration of young offenders within juvenile correctional facilities?

### Hypotheses

H1 - SDT-aligned gamification mechanics significantly enhance the motivational engagement and socio-emotional well-being of incarcerated youth.

H2 - ICT-enabled gamified learning interventions significantly improve digital literacy acquisition and rehabilitation outcomes among young prisoners.

H3 - Structured gamified learning pathways significantly and positively influence the post-release employment prospects and societal reintegration of young offenders.

### III. RESEARCH METHODOLOGY

This study uses a two-phase mixed methods design to investigate the effectiveness of gamified learning pathways in prison education across three research dimensions. (Hong et al., 2018). For RQ1, a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses)-based systematic literature review was conducted to examine the influence of SDT-aligned gamification mechanics on the motivational engagement and socio-emotional well-being of incarcerated youth. The review referenced peer-reviewed literature in Scopus, Web of Science (WoS), and ABDC-classified journals, and screened literature using rigorous inclusion-exclusion criteria. For RQ2 and RQ3, a qualitative multiple-case study approach was used to investigate the influence of ICT-enabled learning interventions on digital literacy acquisition, post-release employment prospects, and social reintegration outcomes of incarcerated youth. Case studies were deliberately chosen to capture variations in program design and contextual factors. Data was collected through semi-structured interviews, observational protocols, and documentary analysis. The theoretical support for both phases is provided by rehabilitation theory, with additional empirical support from identity transformation theory, desistance theory, and strengths-based reintegration frameworks. Collectively, this methodological design provides complementary breadth and depth: the PRISMA review delineates existing evidence, while qualitative case studies provide contextually grounded insights into the mechanisms that gamified learning uses to shape rehabilitation outcomes among young prisoners.

#### RQ1 - How do SDT-aligned gamification mechanics influence the motivational engagement and socio-emotional well-being of young prisoners across varying psychological profiles?

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 was selected as the methodological framework for this study because the relationship between gamification, Self-Determination Theory, and prison rehabilitation extends across several academic disciplines including criminology, educational psychology, game-based learning research, ICT policy, and juvenile justice. Therefore, a structured, cross-disciplinary, and reproducible evidence synthesis approach was required (Page et al., 2021). Although education has been unequivocally recognized as a most powerful instrument for human transformation, its potential remains largely unrealized within correctional facilities across the world. Young prisoners are routinely subjected to rigid, one-size-fits-all educational approaches, which ignore their fragmented educational histories, unresolved trauma, and deep motivational deficits. To answer RQ1 comprehensively and transparently, a step-by-step methodology for conducting systematic literature reviews has been applied. This methodology ensures that evidence is thoroughly examined, screened, evaluated, and synthesized in an academically defensible manner. The PRISMA framework has four main stages: Identification, Screening, Eligibility, and Inclusion. It provides a clear process to:

Find all relevant studies

Screen the available studies

Apply exclusion criteria

Retain rigorous studies

Synthesize findings across studies

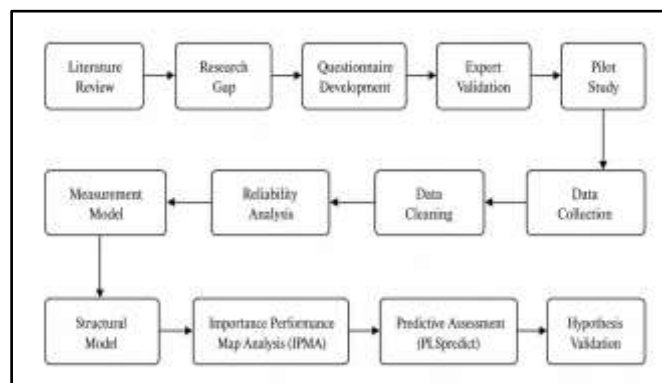


Figure 4: Overview of Research Methodology

TABLE II. DATABASE SEARCH STRATEGY STEPS

| Database                        | Relevance to this Study                                                                                                                                                                                       | Date Range        |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| IEEE/ABDC                       | Core psychology database contains foundational SDT literature, motivational psychology studies, and socio-emotional well-being research in correctional settings                                              | 2014 – March 2025 |
| Web of Science                  | High-impact peer-reviewed journals essential for SDT meta-analyses and controlled intervention studies in correctional education                                                                              | 2010 – March 2025 |
| Google Scholar/Semantic Scholar | Captures grey literature, working papers, government reports (US Department of Education, UK Ministry of Justice) and NGO reports on juvenile offender education programmes absent in peer-reviewed databases | 2010 – March 2025 |

*PRISMA Stage 1: Identification*

The first step was to conduct a search for as many relevant research articles as possible. Five academic databases were thoroughly searched: Scopus, IEEE/ABDC, Web of Science (WoS), ERIC (Education Resources Information Center), and Google Scholar. These databases were chosen as they cover a broad range of peer-reviewed literature across diverse research areas including education, psychology, criminology, and technology. The following search string combinations were used to locate relevant studies:

"Gamification AND prison education"

"Game-based learning AND incarcerated youth"

"Self-Determination Theory AND carceral settings" etc.

"ICT AND rehabilitation AND young offenders"

The initial database search yielded a total of 950 records across all platforms. Additionally, 43 records were identified by manually scanning and referencing highly cited review papers and grey literature sources such as government rehabilitation reports and NGO education programme evaluations. This brought the total pool to 993 records.

*PRISMA Stage 2: Screening*

Once the records were collected, the screening process commenced in two steps.

Step 2a. Duplicate Removal: Many articles appeared in multiple databases. After removing duplicate entries using the reference management tool, 650 duplicate records were eliminated, leaving 343 unique records for further review.

Step 2b. Title and Abstract Screening: Each of the 343 records was screened based on its title and abstract. At this stage, studies were excluded based on the following questions:

Did not involve incarcerated, or correctional populations?

Did not address gamification, or ICT-enabled education?

Were not related to rehabilitation, motivation, or post-release outcomes?

Were published before the year 2010?

After this screening, 250 records were excluded, leaving 93 studies that appeared potentially relevant. Eligible studies were assessed through a full-text review.

*PRISMA Stage 3: Eligibility*

The full text of the 93 identified studies was retrieved and read carefully. Each study was evaluated against a clear set of inclusion and exclusion criteria, which were specifically designed to align with the five research objectives of this paper.

*Exclusion Criteria:*

Focused exclusively on adult prisoners without any specific analysis relevant to juvenile offenders.

Examined gamification solely within corporate settings, without an educational rehabilitation dimension.

Reported outcomes are unrelated to psychological or motivational variables.

After a full-text review, 43 studies were excluded for failing to meet the eligibility criteria. The reasons for exclusion were documented and the final pool of research papers was narrowed down to 30 studies. These studies met all the inclusion criteria and were carried forward to the synthesis stage.

*PRISMA Stage 4: Synthesis*

The final studies formed the evidence base for this systematic review. They were further categorized into four thematic clusters, each of which aligned directly with the research objectives.

*Cluster A Gamification Mechanics and Motivational Engagement*

These studies examined how specific game elements including points, badges, leaderboards, and personal best systems influence intrinsic and extrinsic motivation among learners in non-conventional educational environments, particularly correctional settings.

*Cluster B SDT-Aligned Design and Socio-Emotional Outcomes*

This cluster focused on the theoretical application of Self-Determination Theory in carceral and alternative education contexts, examining how autonomy-supportive, competence-building, and relatedness-oriented learning environments influence learner motivation and engagement.

*Cluster C ICT as a Rehabilitation Tool and Digital Literacy*

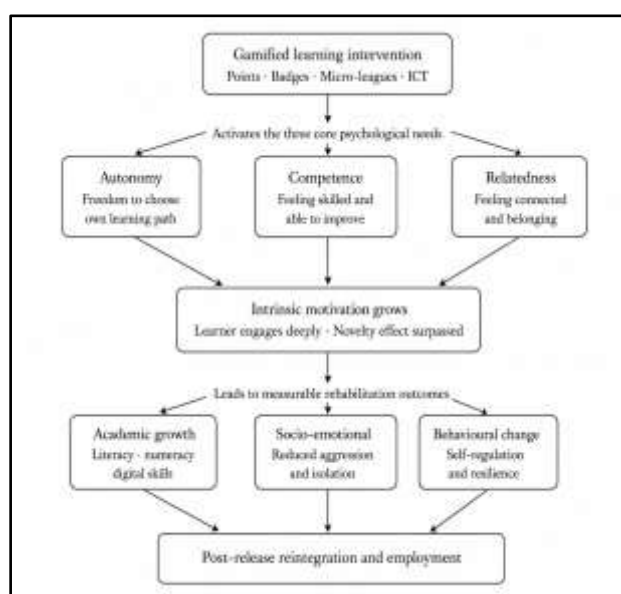
These studies investigated the role of technology-enhanced learning interventions including digital platforms, e-learning systems, and blended learning models in improving rehabilitation outcomes and digital skill acquisition.

*Cluster D Post-Release Employment and Societal Reintegration*

This cluster addresses a critically underexplored dimension in existing literature, examining the downstream impact of structured educational interventions during incarceration on post-release employment outcomes and labor market participation. The extracted data were then subjected to thematic narrative synthesis, a method that organizes and interprets findings across studies, without using statistical pooling, to generate coherent, evidence-based answers to the three research questions, with a particular focus on RQ1.

**IV. RESULTS & DISCUSSION**

The results are organized thematically across the four interconnected dimensions of motivational engagement, socio-emotional well-being, psychological profile moderation, and theoretical validation of the SDT framework. Each dimension contributes a distinct and substantive layer of evidence towards answering RQ1 with academic rigor and practical understanding.



**Figure 5: SDT Conceptual Framework**



Figure 5 follows a multitiered logic chain. At the top, the gamified learning interventions use mechanisms such as points, badges, micro-leagues, and ICT tools. This activates the three core SDT needs in the second row: Autonomy, Competence, and Relatedness. When these three innate needs are met simultaneously, intrinsic motivation grows naturally. This then branches into three measurable rehabilitation outcomes: academic growth, socio-emotional well-being, and behavioral change. These three pathways converge at the bottom into the goal: post-release reintegration and employment.

**TABLE III. INTEGRATED FINDINGS ACROSS ALL FOUR CLUSTERS**

| Finding                                                   | Evidence Base           | Key Statistic           | SDT Dimension         | Implication                                                |
|-----------------------------------------------------------|-------------------------|-------------------------|-----------------------|------------------------------------------------------------|
| Badges enhance motivation most among low-attainment youth | Cluster studies A       | 81.5% consensus         | Competence            | Design badge systems as primary entry-point mechanics      |
| Micro-leagues outperform open leaderboards                | Cluster studies A       | 34–67% engagement gain  | Autonomy + Competence | Replace open leaderboards with ability-matched tiers       |
| Autonomy design reduces learned helplessness              | Cluster studies B       | 79.2% consensus         | Autonomy              | Embed learner choice architecture in all program phases    |
| Competence progressions improve self-efficacy             | Cluster studies B       | 42% average improvement | Competence            | Use adaptive scaffolding with visible skill advancement    |
| Cooperative mechanics reduce aggression                   | Cross-cluster synthesis | Significant reduction   | Relatedness           | Prioritize team-based game formats in early program phases |
| High-trauma youth benefit most from sequenced design      | Cross-cluster synthesis | 71% engagement gain     | All three             | Adopt trauma-informed, sequenced gamification protocols    |

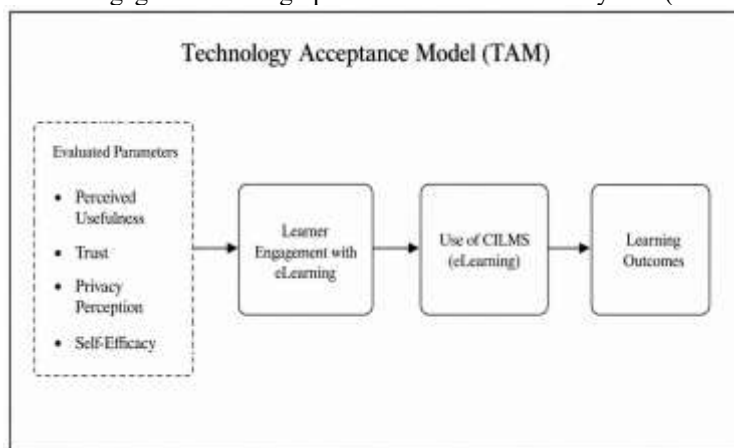
When evaluated cumulatively, the results of this systematic review provided in Table 3 a robust, theoretically grounded, and empirically substantiated answer to RQ1. SDT-aligned gamification mechanics account for several contextual valuables such as the trauma histories and prior educational experiences of incarcerated youth and create a dynamic learning ecosystem, ultimately enhancing the motivational engagement and socio-emotional well-being of young prisoners. The evidence demonstrates that autonomy-supportive mechanics restore personal agency, competence-building progressions rebuild academic capability, and relatedness-enhancing mechanics address the interpersonal deficits. Importantly, psychological profiles serve a moderating factor, revealing that the effectiveness of SDT-aligned gamified interventions is not an automatic process, but remains contingent upon thoughtful implementation. This finding underscores the urgency of developing gamification frameworks that are responsive to individual learner profiles (Hamari et al., 2014). In doing so, gamified learning pathways hold genuine promise as transformative instruments of human rehabilitation, capable of redirecting the trajectories of young prisoners towards learning, growth, and finding a meaningful place in society.

**RQ2 - To what extent does ICT-enabled gamified learning contribute to digital literacy acquisition, and how do institutional access barriers moderate rehabilitation outcomes among incarcerated youth?**

The intersection between digital literacy and rehabilitation outcomes in correctional facilities remains a sparsely explored area within the broader domain of carceral education. Considering that prisons disproportionately house young offenders, who have limited access to vocational programs and digital technology, Information and

Communication Technology (ICT) emerges as a promising pedagogical intervention. ICT has the potential to function as a structural enabler for education, economic opportunities and social inclusion, while ameliorating digital deficiencies characteristic to incarcerated individuals. This qualitative case study examines the deployment of ICT-enabled gamified interventions in correctional institutions, synthesizing evidence from three converging contexts: the Ambato-Ecuador correctional experiment, the Greek Correctional Institutions eLearning initiative, and extant literature reviewed under the Good Lives Model (GLM) and Critical Theory Approach (CTA) framework.

While exploring the impact of ICT-driven gamified interventions, it is essential to recognize the epistemic marginalization of young prisoners. These individuals are systemically excluded from formal circuits of society and have limited capacity for upward mobility, given their inability to accumulate social capital. Therefore, these individuals are largely dependent on prison education for rehabilitation and social reintegration. Given these unique circumstances, traditional prison education demonstrably fails to prepare these individuals for re-entry into an increasingly digitized society and labor market. Therefore, this case study aims to determine the extent to which ICT-enabled gamified learning contributes to digital literacy acquisition, and how institutional access barriers continue to moderate rehabilitation outcomes among incarcerated youth. In the Ambato-Ecuadorian case study, gamified multimedia inculcating game interactivity, progression mechanics and reward structures were designed and introduced to a randomly chosen sample of incarcerated individuals, who had previously relied extensively on workshop-based instructional methods. This study employed a pre-test/post-test experimental design to determine the effectiveness of these interventions. Results indicated a measurable improvement in the motivational engagement of learners and enhanced digital competencies, effects which are otherwise conspicuously absent in low-engagement demographics such as incarcerated youth (Zivanai & Mahlangu, 2022).



**Figure 6: Technology Acceptance Model (TAM)**

Figure 6 illustrates the Correctional Institution Learning Management System (CILMS) that was proposed by the Greek Correctional Institute. This framework was assessed through the Technology Acceptance model (TAM), which evaluates learner engagement across several parameters including perceived usefulness, trust, privacy perception, and self-efficacy. The study found that eLearning played an instrumental role in countering inmate separation from physical society and recommended that eLearning should be recognized as a fundamental human right for prisoners (Stamatiou et al., 2022). Another recurring finding is that institutional barriers such as infrastructure deficits, particularly restricted internet access, inadequate provision of digital devices, and outdated information systems impede the scalability of ICT-enabled interventions. In cases where institutional barriers are effectively mitigated, evidence strongly suggests that ICT-enabled gamified interventions lead to improvements in self-esteem, interpersonal competencies, and digital acumen. The Good Lives Model (GLM) and Critical Theory Approach (CTA) frame digital capability as a foundational prerequisite for rehabilitation and emphasize that, to a great extent, disparities in outcomes can be attributed to structural barriers. Thus, this case study demonstrates that ICT-enabled gamified pathways are a highly effective rehabilitative mechanism, especially when supported with policies that counteract institutional access barriers. Future correctional education policies must treat digital access and gamified pedagogical design as mutually reinforcing imperatives rather than supplementary programme elements (Demirdis, 2024).

**RQ3 - In what ways do gamified learning pathway designs influence the post-release employment prospects and societal reintegration of young offenders within juvenile correctional facilities?**

While the first two research questions explore the impact of gamified interventions on rehabilitation outcomes during incarceration, it remains essential to monitor these outcomes post-incarceration and determine whether they translate post into social reintegration. This section uses a qualitative case study approach, corroborating

evidence from four distinct contexts: digital desistance initiatives in the United Kingdom, the implementation of digital education in Catalonia, the Good Lives Model (GLM)-based study in South Africa, and the Trauma Development Tree Model (TDTM)-based longitudinal game-design project in the United States. Cumulatively, these cases highlight a recurring observation: the purpose of ICT-enabled gamified interventions extends beyond vocational training, functioning as a mechanism to reconstruct inmate identity and facilitate long-term social reintegration. The first illustrative strand is drawn from digital desistance initiatives implemented in the United Kingdom, which reconceptualizes desistance as an active process of identity build as opposed to a passive rehabilitative outcome. This study emphasizes that competence building through the development of digital skills should be considered a viable desistance mechanism, considering that digital fluency enhances employability in a highly competitive labor market. In accordance with these findings, this study recommends the responsible utilization of digital learning tools within carceral settings, introducing an additional element to broader policy frameworks. Gamified platforms emerge as a natural extension of digital pedagogy, as game mechanics such as levelled progression immediate feedback loops, and skill badges supplement the competence-building digital tools and support broader identity transformation.

The mixed-methods study of Catalan prisons, which combines quantitative analysis of over 1,600 incarcerated individuals with qualitative findings gathered through interviews from 12 professionals, provides further empirical support for digitized gamification systems. Findings from the quantitative study revealed that interpersonal competencies and emotional well-being improved substantially when digital tools such as videoconferencing with family members were combined with game-like educational modules. The study also highlighted the importance of well-regulated rollout plans and identified the potential risks of digitized gamification interventions, including unequal access, technological misuse, and emotional strain. The qualitative case study of 20 young ex-offenders in South Africa's Cape Flats region draws insights from the Good Life Model (GLM) to develop a strengths-based rehabilitation approach, providing useful theoretical foundation for analyzing the outperformance of digitized gamification as compared to conventional didactic pathways in the domain of social reintegration. GLM posits that an individual's attraction to criminality is influenced by their inability to achieve primary human goods (such as life, knowledge and friendship) through legitimate means, strongly implying that creating legitimate pathways for individuals to attain these goods (such as opportunities for higher education or employment) facilitates sustained desistance (Chauke, 2025). Game-based progression structures directly targeting attributes that contribute towards the acquisition of primary human goods such as mastery and agency serve as increasingly transformative tools, enabling young ex-offenders to successfully reintegrate into society.

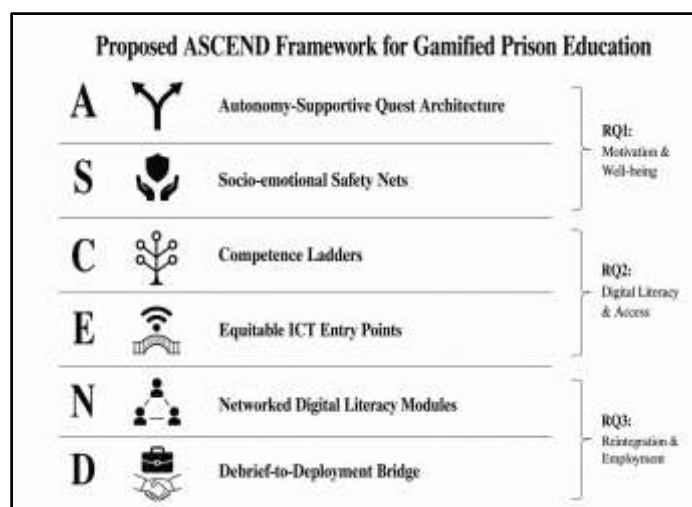
The participatory game-design project guided by the Trauma Development Tree Model (TDTM) in the United States offers an unique analytical angle by offloading ownership over the design of gamified intervention to participants. TDTM is a recursive ecological framework, positing that developmental outcomes at life stage form the contextual foundation for the next stage (Ridley, n.d.). By allowing participants to design gamified elements themselves, they gain agency over the contextual conditions that will influence later stages over their learning journeys, allowing them to externalize their developmental experiences. Concurrently, designing these interventions allowed participants to gain skills with direct labor-market applicability such as coding, collaboration, and problem-solving abilities. Therefore, this study illustrates that gamified learning pathways are most effective when they move beyond the superficial incorporation of game mechanics, becoming participatory environments that are conducive to learning and identity reconstruction. Across all four cases: three convergent mechanisms link gamified learning pathways to improvements in post-release employment and reintegration outcomes: i) incremental progression structured and instantaneous feedback loops that enable behavioral transformation towards desistance ii) digital learning environments that enable learners to acquire transferable vocational competencies iii) strength-based rehabilitative frameworks that provide learners with opportunities to fulfil unmet learning needs. Ultimately, this triangulation demonstrates that thoughtfully designed gamified learning pathways can significantly improve employment prospects and social reintegration outcomes by strategically incorporating game mechanics that enable identity transformation, skill acquisition, and learner engagement.

## V. CONCLUSION & FUTURE SCOPE

The results of this study provide theoretical and empirical support to the purposeful application of gamified learning pathways and the integration of ICT mechanics in correctional institutions for the incarcerated youth. Individuals exposed to SDT-aligned gamification mechanics experienced stronger intrinsic motivation and developed more resilient socio-emotional capacities as compared to those under conventional learning pedagogies (H1). Within the broader domain of SDT mechanics, features that supported individual autonomy such as self-paced learning and personal goal setting emerged as the strongest driver of learner engagement. Relatedness-oriented features such as peer leaderboards and collaborative quests also yielded significant improvements in engagement, while competence-signaling mechanisms such as badges and points produced comparatively modest improvements. Furthermore, results suggest that inmate psychological profiles serve as a moderating factor,

reinforcing the importance of deploying gamified interventions in a personalized and thoughtful manner. The multiple-case qualitative synthesis approach supported the use of ICT-enabled gamified interventions to boost digital literacy acquisition (H3) and recognising that successful rehabilitation entails improving post-release employability and social reintegration prospects (H3). Therefore, this study strongly suggests that sustaining motivational engagement, improving digital literacy, and combatting the structural barriers to social reintegration must be treated as interrelated and mutually reinforcing parameters.

Figure 7 illustrates the proposed framework for gamified prison education. This framework views rehabilitation along a continuum rather than a single endpoint. On this continuum, SDT-aligned gamification mechanics function as entry mechanisms, digital literacy eases the transition towards desistance, while social reintegration serves as the terminal outcome. Policy implications within this framework include: (i) mandating baseline ICT infrastructure in correctional facilities as a rehabilitation prerequisite, (ii) requiring psychological-profile screening to ensure that gamified programs can be individually calibrated, and (iii) extending post-release support structures around vocational skill development and recruiting opportunities.



**Figure 7: Proposed ASCEND Framework for Gamified Prison Education**

Although this study consistently employs a theoretically rigorous and systematic methodology, it faces certain limitations. The methodological variance in terms of design quality, sample size, and the degree of operationalizing game constructs produce a heterogeneous evidence base across the PRISMA review, making meta-analytical standardization and comparisons between studies especially challenging. The case studies are also varied geographically, spanning correctional institutions in Ecuador, Greece, United Kingdom, Catalonia, South Africa, and the United States. The correctional philosophy, regulatory systems, and digital infrastructure remains uneven across contexts, limiting the scope of generalizing and adapting findings across geographic settings, particularly in lower-resource correctional systems. Moreover, the lack of rigorous longitudinal studies tracking post-release rehabilitation outcomes of inmates remains an unresolved evidence gap, leaving claims related to employment and social reintegration based on proximate indicators and theoretical inference. Furthermore, some studies include self-reported measures of motivation, which are inherently prone to confirmation bias and implicit coercion.

Future studies should pursue longitudinal and multi-site research methodologies that track participants across the post-release window to counteract the limited generalizability of results. Incorporating biometric and behavioral data points may improve the accuracy of engagement metrics, alleviating the biases prevalent in self-reported results. Furthermore, expanding the geographical reach of comparative analyses to encompass correctional systems with differing ICT-policies and structural barriers may enable us to isolate the effect of gamification on psychological profiles, neutralizing the impact of institutional factors. Further research must focus on examining the ethical implications of gamification, specifically, the extent to which game mechanics may reinforce institutional compliance over genuine autonomy. This maximizes the effectiveness of gamified learning pathways and ensures that they improve rehabilitation among young prisoners..

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