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The Effect of Gamification Strategy on Students Motivation and Achievement in Algebra Learning

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ABSTRAK

Perubahan sistem kerja jarak jauh mendorong organisasi untuk mencari pendekatan baru dalam mengelola kinerja dan motivasi karyawan. Penelitian ini bertujuan menelaah peran gamifikasi dalam manajemen kinerja jarak jauh (remote performance management) serta relevansinya terhadap Generasi Alpha sebagai tenaga kerja masa depan. Pendekatan yang digunakan adalah narrative literature review terhadap publikasi akademik dan *gray literature* periode 2020–2025. Hasil kajian menunjukkan bahwa penerapan elemen gamifikasi, seperti poin, penghargaan digital, dan umpan balik instan, mampu meningkatkan motivasi intrinsik, kolaborasi, dan keterlibatan karyawan. Efektivitasnya sangat bergantung pada desain yang berpusat pada manusia, dukungan teknologi, dan kepemimpinan adaptif. Bagi Generasi Alpha, yang tumbuh dalam lingkungan digital dan interaktif, gamifikasi menjadi pendekatan yang relevan untuk menciptakan pengalaman kerja yang lebih menarik dan bermakna. Kebaruan penelitian ini terletak pada integrasi konsep gamifikasi, manajemen kinerja jarak jauh, dan kesiapan Generasi Alpha dalam membangun sistem kerja yang human-centered dan berkelanjutan.

Kata kunci: gamifikasi; manajemen kinerja jarak jauh; Generasi Alpha; motivasi kerja.

ABSTRACT

The rapid expansion of remote and hybrid work has urged organizations to adopt new approaches to managing employee performance and motivation. This study aims to examine the role of gamification in remote performance management and its relevance to Generation Alpha as the future workforce. A narrative literature review was conducted by analyzing academic publications and gray literature published between 2020 and 2025. The findings reveal that the implementation of gamification elements such as points, digital rewards, and instant feedback can enhance intrinsic motivation, collaboration, and employee engagement. Its effectiveness largely depends on human-centered design, technological readiness, and adaptive leadership. For Generation Alpha, who have grown up in an interactive and technology-driven environment, gamification represents a highly relevant approach to building meaningful and engaging work experiences. The novelty of this study lies in integrating the concepts of gamification, remote performance management, and Generation Alpha readiness into a comprehensive framework for developing human-centered and sustainable digital work systems.

Keywords: gamification; remote performance management; Generation Alpha; work motivation.

PENDAHULUAN



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Employee performance management has undergone a profound transformation due to the increasing adoption of remote and hybrid work arrangements. This transformation is not merely technical but also conceptual, shifting from time-based supervision systems toward results-oriented and performance-based management. Research indicates that such work models compel organizations to adopt new approaches, including the use of outcome-based performance metrics instead of time-based ones, the enhancement of communication quality, the establishment of adequate technological infrastructure, and the implementation of adaptive leadership to sustain employee engagement and productivity. Factors such as work efficiency, quality of outcomes, and work-life balance have emerged as primary determinants of performance in remote environments, while excessive monitoring may instead reduce motivation (Basir et al., 2025). Within this context, effective performance management strategies in the remote work era must encompass the establishment of clear expectations, the provision of regular feedback, continuous training, and support for employee well-being and career development (Maghfur & Isnanto, 2025).

The global paradigm shift following the COVID-19 pandemic has accelerated a massive transition toward remote and hybrid work systems. A Deloitte (2022) survey reported that 56% of the global workforce had transitioned to hybrid or remote models, with 99% of them expressing appreciation for the flexibility offered (Deloitte, 2021). Nevertheless, this transition has introduced new challenges in sustaining employee motivation, collaboration, and performance when individuals are no longer situated in the same physical workspace. The use of digital technologies, including artificial intelligence, can facilitate fair and ethical performance monitoring; however, it remains essential to incorporate approaches that emphasize communication, empathy, and intrinsic motivation among employees (Shettigar et al., 2025).

One of the most innovative approaches increasingly explored to address these challenges is gamification. In the context of remote performance management, gamification has proven effective in enhancing engagement, motivation, and employee performance through the integration of game-like elements such as points, leaderboards, and badges, which stimulate active participation and foster a sense of achievement. The integration of mobile technology and digital platforms further amplifies the effectiveness of gamification by enabling more real-time, transparent, and data-driven interactions, thereby cultivating a more interactive and collaborative work environment (Benitez et al., 2022; Nugroho & Dewi, 2025). Through such systems, remote employees can receive instant feedback, track their performance progress, and feel more connected to organizational goals despite geographical separation.

Furthermore, gamification functions not only as a mechanism for enhancing motivation but also as a behavioral management strategy that promotes perceptions of fairness, organizational commitment, and job satisfaction. Empirical studies reveal that gamification can improve perceptions of procedural justice and increase employee loyalty, as reward and feedback systems are implemented in a more transparent and measurable manner (Bizzi, 2023). These positive psychological effects ultimately contribute to higher productivity, stronger employee retention, and healthier team relationships within the remote work context.

In the context of the future workforce demography, Generation Alpha has emerged as a central focus of attention. This generation has grown up in a fully digital environment

highly familiar with technology, mobile devices, and game-based interactions from an early age. Several studies describe Generation Alpha as true digital natives who possess distinct learning and working preferences compared to previous generations (Karatayev et al., 2023). They are accustomed to receiving rapid feedback, engaging in interactive experiences, and obtaining tangible digital rewards. Consequently, organizations must adapt their performance management strategies and job design to align with these preferences, including the integration of gamification throughout the entire work cycle and career development process (Karatayev et al., 2023; Nugroho & Dewi, 2025).

For Generation Alpha, who are shaped by digital technologies and game-based experiences, the use of gamification is expected to be particularly relevant for supporting future performance management practices. They tend to respond positively to systems that emphasize digital rewards, transparency, and instant feedback (Nugroho & Dewi, 2025). This aligns with the perspective of Flores and Guevara (2021), who argue that this generation will expect work experiences that are interactive, challenging, and infused with game-like elements. Therefore, integrating gamification into remote performance management can serve as an effective strategy to enhance their productivity, engagement, and job satisfaction in the future workforce landscape.

Conceptually, the novelty of this study lies in synthesizing three dimensions that have previously been discussed separately in the literature: (1) the paradigm shift in performance management driven by remote work, (2) the application of gamification within digital work systems, and (3) the readiness of Generation Alpha as the future workforce demanding technology-driven and interactive work experiences. This synthesis is expected to provide a new conceptual foundation for organizations in designing performance management strategies that are human-centered, adaptive, and technologically integrated to effectively address the characteristics and expectations of the emerging generation of workers.

METHODS

This study employs a narrative literature review approach, focusing on thematic synthesis of various academic and gray literature relevant to the topics of gamification, remote performance management, and Generation Alpha. The literature search was conducted purposively across major databases such as Scopus, ScienceDirect, and Google Scholar, as well as through professional reports from institutions such as Deloitte and McKinsey, covering the publication period from 2020 to 2025.

The criteria for literature selection include topic relevance, conceptual contribution, and direct linkage to the dynamics of digital performance management. Publications prior to 2020 were retained only if they provided substantial theoretical value or represented seminal works in the fields of gamification and digital work behavior.

The analytical process was conducted using a thematic-narrative approach, which involved categorizing findings into key thematic areas such as the effectiveness of gamification in enhancing motivation and performance, challenges in implementing gamified systems within remote work environments, and their relevance to the characteristics of Generation Alpha. The synthesis was carried out descriptively and interpretively to produce a comprehensive conceptual understanding of the topic. As this study does not involve human participants, ethical clearance or institutional review board approval was not required.

RESULT AND DISCUSSION

Generation Alpha, born after 2010, is projected to bring significant transformation to the future of the workforce due to their unique characteristics as digital natives who are highly familiar with technology, social media, and artificial intelligence (Westover, 2024). They demonstrate strong values of creativity, leadership, and autonomy in decision-making, while placing great importance on work-life balance and sustainability, including heightened awareness of social and environmental issues. This generation also tends to demand a work environment that is collaborative, flexible, and transparent, expecting the use of information and communication technologies (ICT) to support both sustainability goals and work efficiency (Wojtaszczyk et al., 2024).

The distinctive characteristics of Generation Alpha make them particularly receptive to gamification approaches within performance management systems. As a generation accustomed to interactive, feedback-driven digital experiences, they are likely to be more motivated by work systems that offer challenges, instant rewards, and opportunities for virtual collaboration. Gamification can thus serve as a strategic bridge between organizational needs for enhanced productivity and Generation Alpha's expectations for a dynamic, transparent, and meaningful work environment. By integrating elements such as points, rankings, and digital rewards into remote performance management, organizations can not only strengthen employee engagement but also create work experiences that align with the values, learning styles, and digital fluency of this emerging generation of digital natives.

1. Efektivitas Gamifikasi terhadap Kinerja dan Motivasi

Meta-analytical and systematic review studies demonstrate that gamification has a significant, albeit small to moderate, positive effect on both performance and motivation, across learning and non-game task contexts (Ratinho & Martins, 2023). Gamification elements such as points, badges, leaderboards, and challenges have been shown to enhance motivation, engagement, as well as cognitive and behavioral outcomes, particularly when they are well-designed and integrate both competitive and collaborative components.

Research further indicates that the core elements of gamification such as points, leaderboards, badges, and instant feedback can simultaneously stimulate intrinsic and extrinsic motivation. Intrinsic motivation emerges when individuals feel challenged, strive to achieve goals, and receive digital recognition for their efforts, while extrinsic motivation is reinforced through structured systems of rewards and measurable achievements. Experimental studies confirm that digital achievements (e.g., badges and leaderboards) can enhance performance and motivation, particularly by fostering persistence, even though their effects on enjoyment or interest are not always statistically significant (Justin & Joy, 2024). Gamification also contributes to the creation of more interactive, transparent, and results-oriented work or learning environments, thus promoting a culture of result-based performance (Getman et al., 2024).

Empirical evidence shows that integrating gamification into performance management systems, particularly in virtual and hybrid teams, consistently improves participation, engagement, and employee productivity. Elements such as direct feedback and visualization of progress foster a sense of control, responsibility, and

goal clarity, which ultimately strengthen both individual motivation and performance. Moreover, gamification enhances emotional engagement and work focus while fostering a more transparent and interactive work atmosphere that supports a results-driven organizational culture (Rahiman et al., 2023).

The effectiveness of gamification is reflected in measurable outcomes such as increased task completion rates, faster response times, and improved work quality, with some organizations reporting productivity gains of 17–30% following the implementation of gamified systems (Benitez et al., 2022). However, these positive outcomes are highly dependent on the design of the gamification system itself. Overly competitive structures may undermine collaboration and induce stress, making collaborative gamification which balances individual and team-based rewards highly recommended. Overall, well-designed gamification can serve as an effective strategy to enhance engagement and productivity, particularly within the context of remote performance management (Rahiman et al., 2023).

2. Gamification as a Solution to Remote Work Challenges

Research emphasizes that the effectiveness of gamification is highly influenced by factors such as system design, organizational culture, technological readiness, and user perception (Khan et al., 2020). The primary challenge in implementing gamification lies in ensuring that system design aligns with the nature of work and organizational values; systems that overemphasize individual competition can induce psychological pressure, reduce collaboration, and create inequities among workers (Khan et al., 2020).

a. Design Challenges and Organizational Adaptation

The main challenges in designing and adapting gamification as a remote work solution include the compatibility of gamified elements with the needs of virtual teams, technological limitations, and the importance of tailoring design to organizational context and culture (Pura, 2021). Systems that focus excessively on individual competition can lead to psychological strain, hinder collaboration, and foster workplace inequality (Bizzi, 2023). Additionally, the novelty effect may occur if organizations fail to regularly update content or challenges, making it essential for gamification systems to remain dynamic and adaptable to behavioral and technological changes (Khan et al., 2020).

Another critical issue involves managing unrealistic expectations of gamification, as excessive focus on entertainment rather than work objectives may lead to disappointment or long-term motivational decline (Klein, 2021). Organizations must therefore ensure that gamification systems remain flexible, easily adaptable, and regularly updated to maintain relevance and engagement (Trinidad et al., 2021). Collaboration among game designers, motivational psychologists, and management professionals is essential to developing sustainable and effective gamified solutions in remote work settings. Studies show that gamification enhances motivation and engagement in remote work; however, its effectiveness depends on the careful selection of elements (e.g., points, leaderboards, badges) and the integration of meaningful feedback relevant to user tasks and needs (Erdős et al., 2023).

b. Technological and Digital Infrastructure Factors

The success of gamification in remote performance management depends heavily on the availability of adequate technology and the integration of supportive digital systems. Common barriers include limited internet access, data security risks, and interoperability issues across platforms (Deloitte, 2022). In distributed global work environments, technical challenges such as system latency, connectivity disruptions, or poor user experience design can reduce user participation (Benitez et al., 2022).

Recent studies highlight that successful gamification systems are supported by the integration of artificial intelligence (AI) and advanced data analytics, enabling real-time adaptation of feedback loops based on individual performance. Machine learning systems can analyze user behavior data to provide personalized challenges, maintain engagement without inducing fatigue, and dynamically adjust difficulty levels and reward types (Hussein et al., 2025).

c. Cultural and Psychological Factors

The success of gamification is not solely determined by technology but also strongly influenced by organizational culture and user demographics. Crosscultural studies reveal that responses to reward and competition systems differ across generational, gender, and cultural lines. For instance, employees from collectivist cultures tend to value team-based gamification over individual competition, while women often prefer elements that emphasize cooperation, perseverance, and resilience, and men are more drawn to avatars or rewards reflecting identity and personal achievement (Flores & Guevara, 2021).

Perceived fairness and transparency are critical to maintaining user trust and intrinsic motivation. If the reward mechanisms or algorithms are perceived as unfair, manipulative, or opaque, user trust and psychological engagement can deteriorate. Research emphasizes that ethical gamification systems should be designed with principles of transparency, accountability, and fairness, clearly explaining algorithmic logic, assessment criteria, and reward mechanisms (Tejedor & Cencerrado, 2024).

d. Human Resources Readiness and Digital Leadrship

Successful gamification implementation depends greatly on adaptive digital leadership and workforce readiness to interact with new technologies. Studies show that many organizations fail in the early stages of gamification adoption due to insufficient training, resistance to change, or lack of understanding of the system's purpose; leaders who effectively communicate the benefits and meaning of gamification are more likely to foster positive employee acceptance (Aji & Mala, 2024). Effective leadership is crucial to ensuring that gamification objectives align with organizational values and practical needs (Gillmore, 2021).

Long-term success also requires a culture of continuous learning and two-way feedback. Employees should be involved in the design and evaluation process

to ensure that gamification mechanisms are collaborative rather than top-down. Organizational readiness including both technological and human readiness is therefore vital to ensuring that gamification adoption proceeds smoothly and positively impacts motivation and performance. Investments in training, clear communication, and active employee involvement are essential to support gamification-based digital transformation in remote work environments (Thongmak, 2021).

e. Ethical and Sustainability

Gamification in the workplace introduces ethical dilemmas between digital monitoring and employee autonomy. While gamified systems produce detailed performance data, excessive use of metrics can create feelings of surveillance, reduce freedom, and harm psychological well-being. Studies indicate that the lower the data protection standards, the weaker employees' autonomy and self-determination become; thus, implementing a "privacy by design" principle is crucial to safeguarding both autonomy and data privacy (Ruggiu et al., 2022).

Balancing the use of performance data for professional development and protecting individual privacy is essential. Ethical gamification practices must avoid exploitation, manipulation, and privacy violations while ensuring transparency in data usage. Involving employees in system design and giving them control over their personal data enhances trust and promotes a psychologically healthy workplace (Ruggiu et al., 2022). Responsible gamification design should balance data utilization for professional growth with individual privacy protection (Kirchner-Krath et al., 2024).

To ensure sustainability, gamification should promote positive and collaborative behaviors rather than function solely as a monitoring mechanism. Transparent, accountable, and participatory design approaches can mitigate ethical risks and increase system acceptance in the workplace (Kirchner-Krath et al., 2024). Balancing digital oversight with employee autonomy is therefore key to enabling gamification to contribute ethically and effectively to organizational sustainability objectives.

3. Generation Alpha and the Transformation of Work Culture

As a generation deeply immersed in digital technology, Generation Alpha is expected to drive a transformation in work culture toward more flexible, collaborative, and data-driven models. In the context of remote performance management, gamification has been shown to enhance employee motivation and engagement through elements such as points, leaderboards, and badges features particularly relevant for a generation raised alongside technology and gaming (Pura, 2021). Studies suggest that implementing gamification in remote performance management can help address motivation and engagement challenges common in remote work environments while fostering a more participatory and adaptive organizational culture (Pura, 2021; Skidan, 2025).

To maximize gamification's positive impact, organizations should integrate principles of game design, motivational psychology, and modern management while ensuring

the inclusive and ethical use of technology (Skidan, 2025). Communication quality, technological infrastructure, and leadership style are also critical in creating a productive remote work environment that supports engagement, particularly for Generation Alpha, who prioritize transparency and real-time feedback (Tawalbeh, 2025). Hence, gamification holds strategic potential for shaping future work cultures that are dynamic, collaborative, and performance-oriented, consistent with Generation Alpha's digital-native characteristics (Skidan, 2025).

Accordingly, this study highlights that gamification not only enhances motivation and engagement in remote work systems but also provides new direction for performance management in the digital era. The novelty of this research lies in integrating gamification concepts within the remote performance management framework, focusing on the readiness of Generation Alpha as the future workforce. This approach extends the understanding of gamification beyond a mere motivational tool, positioning it as $\bf a$ human-centered management strategy that is technologically adaptive and relevant to the experiential and participatory nature of digital-native generations.

Managerial Implications and Future Research Recommendations

The findings of this study provide significant implications for developing performance management strategies in the digital age. Gamification should not only be viewed as an instrument for enhancing motivation but also as an experiential learning tool that strengthens collaborative and transparent work cultures. Organizations are encouraged to develop digital performance management systems that integrate gamification within a human-centered design framework, ensuring that reward mechanisms, feedback processes, and self-reflection practices are implemented fairly and adaptively according to employee characteristics.

Employee participation in the design process is a key factor to ensure that gamification systems genuinely reflect the values and preferences of Generation Alpha. At the same time, data analytics and artificial intelligence can be leveraged to personalize challenges and rewards, thereby creating engaging and sustainable work experiences that balance motivation with autonomy. This approach not only enhances engagement and retention but also strengthens organizational identity as innovative and technologically adaptive.

Future research should empirically examine the effectiveness of specific gamification elements on performance dimensions such as creativity, collaboration, and psychological well-being. Longitudinal studies are also necessary to assess the consistency of gamification's effects over time and its role in shaping motivation and work behavior across generations. Such research would expand conceptual models linking technology, motivation, and digital performance systems.

CONCLUSION

This study concludes that gamification holds strategic potential for strengthening the effectiveness of remote performance management, primarily by enhancing motivation, participation, and employee engagement. Elements such as digital rewards, instant feedback, and challenge-based assessment systems can create more interactive and meaningful work experiences. The success of gamification depends on its alignment with

workforce characteristics, organizational technological readiness, and sensitivity to ethical considerations and work-life balance.

For Generation Alpha, this approach is particularly relevant, as they have grown up in a digital ecosystem characterized by speed, interactivity, and real-time performance recognition. Organizations must therefore strategically integrate gamification into performance management systems to attract, retain, and develop the next generation of technologically adaptive workers.

Conceptually, this study contributes to the academic discourse by highlighting the intersection between gamification and Generation Alpha's readiness within remote work contexts. However, as a literature-based study, it is limited in providing empirical evidence. Future research is thus recommended to employ quantitative or field-experimental approaches to test the direct effects of gamification elements on performance and motivation across diverse industrial sectors.

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