



GAMIFICATION AND AI IN STUDENT ENGAGEMENT

Dr.P.V. Nandhini

Assistant Professor,

UG Department of Commerce CA,

Nallamuthu Gounder Mahalingam College, Pollachi

ABSTRACT:

Gamification and AI have emerged as a transformative tool in modern education, significantly reshaping how students interact with learning content and how educators design instructional strategies. Gamification is defined as the application of game design principles in non-game contexts. It incorporates game-like elements such as points, badges, levels, leaderboards, rewards and mission-based tasks to foster motivation, curiosity and active participation among learners. These kinds of elements create a sense of achievement and competition that encourages students to engage more deeply with academic material. AI can analyse student performance in real time, identify learning gaps and adjust the difficulty or content accordingly. The integration of these technologies not only makes the learning more enjoyable and interactive but also ensures that the instructional delivery is aligned with the unique learning pace, preference and challenges of each student. When gamification is combined with AI-driven personalisation, the adaptive feedback and intelligent tutoring systems, and the gamification transcends the traditional classroom boundaries, by creating a dynamic and immersive learning environment. The AI algorithms can analyse the student behaviour, also predict learning trajectories and will tailor the gamified experiences to the needs of individuals, thereby ensuring inclusivity and equity in the field of education. The impact of gamification and AI on student engagement can be understood through multiple dimensions. First, gamification introduces intrinsic and extrinsic motivators that transform passive learning into an interactive journey where students perceive progress as achievement rather than obligation. However, challenges such as ethical concerns data privacy, and the risk of over-reliance on technology must be critically addressed to ensure responsible implementation. These abstract underscores the potential of gamification and AI to revolutionise student engagement, offering a roadmap for educators, researchers and policymakers to harness these innovations for inclusive and impactful learning.

Keywords: *transformative tool, personalisation, interactive, data privacy.*

INTRODUCTION:

Education in the twenty-first century is undergoing a profound transformation, driven by the convergence of digital technologies and innovative pedagogical strategies. Among these, gamification and artificial intelligence (AI) have emerged as powerful tools to reimagine student engagement, motivation, and learning outcomes. Gamification applies game mechanics—such as rewards, challenges, and progress tracking—to non-game contexts, thereby creating immersive and interactive learning environments. AI, on the other hand, introduces adaptive intelligence into these systems, enabling personalised learning pathways, predictive analytics, and real-time feedback. Together, they form a synergistic framework that not only addresses the persistent issue of student disengagement but also aligns with global educational priorities of fostering creativity, collaboration, and lifelong learning skills.

The convergence of gamification and AI has created new opportunities for data-driven and learner-centred education, particularly in digital and hybrid classrooms. AI-powered gamified platforms can track student behaviour, predict disengagement, and provide instant interventions through personalised rewards, progress dashboards, and tailored challenges that maintain student interest over time. These tools encourage self-directed learning, collaboration, and a growth mindset by transforming routine academic tasks into dynamic and immersive learning experiences. Despite its potential, the integration of gamification and AI also presents challenges such as unequal access to technology, concerns about data privacy, and the need for extensive teacher training to ensure effective implementation. However, when applied ethically and strategically, these innovations can significantly elevate learning outcomes and foster sustained student engagement across various educational levels. By making learning both meaningful and enjoyable, gamification and AI together represent a powerful advancement in educational technology, offering a pathway toward more inclusive, interactive, and future-ready learning ecosystems.

Gamification involves integrating elements commonly found in games—such as points, badges, leaderboards, levels, challenges, and rewards—into educational activities to make learning more motivating and enjoyable. When students perceive academic tasks as interactive and achievement-oriented, their participation naturally increases. Alongside this, AI plays a transformative role by enabling real-time data analysis, adaptive learning pathways, intelligent tutoring systems, automated feedback, and predictive analytics. By combining these elements, AI-powered gamified learning platforms can adjust the difficulty of tasks, provide personalised encouragement, and track individual progress to sustain interest and reduce disengagement. Together, gamification and AI represent a powerful fusion of motivation and technology that redefines the educational experience. Their integration not only promotes active involvement and deeper understanding but also encourages self-regulation, collaboration, and long-term academic growth. As education continues to evolve, the adoption of gamification and AI stands as a promising approach to creating dynamic, meaningful, and future-ready learning environments.

Student engagement has become a central focus in contemporary education as institutions strive to create learning environments that are motivating, interactive, and relevant to the digital generation. Traditional teaching methods, while effective in certain contexts, often struggle to fully capture the attention and sustained participation of today's learners, who are accustomed to visually rich, fast-paced, and technology-driven experiences. As a result, educators and researchers have increasingly turned to innovative strategies such as

gamification and Artificial Intelligence (AI) to enhance engagement, improve learning outcomes, and create more personalised educational experiences. These emerging tools not only enrich the learning process but also address the diverse needs, preferences, and abilities of students across various academic levels.

STATEMENT OF THE PROBLEM:

In recent years, maintaining active student engagement has become a significant challenge in educational institutions. Traditional teaching methods often fail to sustain students' interest and motivation, particularly in technology-driven learning environments where students expect interactive and personalized experiences. Gamification has been introduced as an innovative strategy to enhance motivation by incorporating game elements such as points, badges, leaderboards, and rewards into the learning process. These elements aim to make learning more enjoyable and encourage students to participate actively in academic activities. However, despite its growing popularity, the actual effectiveness of gamification in improving student engagement and motivation requires further examination in different educational settings.

At the same time, the advancement of Artificial Intelligence (AI) in education offers new opportunities for personalized learning. AI-powered tools can analyse student performance, provide adaptive learning paths, and deliver immediate feedback to support individual learning needs. Although these technologies show promise in enhancing learning experiences, many educational institutions still face challenges in understanding how AI can be effectively integrated with gamification strategies to maximize student engagement. Therefore, there is a need to investigate the role of gamification in motivating students and to analyse how AI-based learning systems contribute to personalized and engaging educational experiences. This study aims to explore these aspects to better understand how the combined use of gamification and AI can improve student participation, motivation, and overall learning outcomes.

1. What factors influence students' acceptance and willingness to use gamified and AI-enabled learning systems?
2. How effective are specific gamification elements (such as points, badges, leaderboards, challenges, and rewards) in enhancing students' overall engagement in the learning process?

OBJECTIVES OF THE STUDY:

- To identify the factors that influence students' acceptance of gamified and AI-enabled learning systems
- To examine the effectiveness of gamification elements in enhancing the students' overall engagement in the learning process

RESEARCH METHODOLOGY

METHODOLOGY

The study is based on primary data collected by issuing questionnaires.

SAMPLING

A sample of 70 respondents from the area in and around Pollachi taluk based on the convenience sampling method.

FRAMEWORK OF ANALYSIS

Data collected have been analysed by making use of appropriate statistical tools, which include simple percentage and Garrett ranking test.

SIGNIFICANCE OF THE STUDY:

The integration of gamification and Artificial Intelligence (AI) in education has gained increasing attention as a strategy to enhance student engagement, motivation, and learning outcomes. Traditional teaching methods often struggle to sustain students' interest in the digital age, making it essential to explore innovative instructional approaches. This study is significant because it examines how gamified learning elements such as points, badges, leaderboards, and challenges, combined with AI-driven personalized learning systems, can influence students' acceptance and engagement in the learning process. Understanding the factors that affect students' willingness to adopt gamified and AI-enabled learning platforms can help educators design more effective and interactive educational environments. Moreover, the findings of this study may provide valuable insights for teachers, educational institutions, and policymakers in implementing technology-based learning strategies that promote active participation and improved academic performance. Ultimately, the study contributes to the growing body of knowledge on educational technology and supports the development of innovative, student-centered learning systems.

REVIEW OF LITERATURE:

1. Jaramillo-Mediavilla, L., Basantes-Andrade, A., Cabezas-González, M., & Casillas-Martín, S. (2024). **Impact of gamification on motivation and academic performance: A systematic review.** *Education Sciences*, 14(6), 639. This systematic review examined several research studies to understand how gamification affects student motivation and academic performance. The findings revealed that game elements such as points, rewards, and badges significantly improve learners' motivation and help them better acquire knowledge and academic skills. The study concluded that gamified learning environments can enhance engagement and encourage active participation among students when implemented effectively.
2. Pelizzari, F. (2024). **Gamification in higher education: A systematic literature review.** *Italian Journal of Educational Technology*. This review analysed multiple studies related to gamification in higher education. The research emphasized that gamification promotes interactive learning by incorporating game-based strategies that improve students' engagement and motivation. The author also highlighted that gamification helps create active learning environments where students participate more actively in classroom activities and online learning platforms.

3. Safdar, U., Shafi, S., & Junaid, M. (2025). **The impact of AI-driven gamification on student engagement and academic performance in English language teaching.** *Indus Journal of Social Sciences*, 3(1), 646–656. This study explored the integration of AI and gamification in language learning classrooms. The findings indicated that AI-based gamified learning systems provide adaptive and personalized learning experiences that improve students' motivation, engagement, and knowledge retention. The research also noted challenges such as technological accessibility and the need for teacher training when implementing AI-supported gamification.
4. Alenezi, A. (2023). **Teacher perspectives on AI-driven gamification: Impact on student motivation, engagement, and learning outcomes.** *Information Technologies and Learning Tools*. This research focused on teachers' perceptions of AI-driven gamification in education. The study found that educators believe gamification supported by AI enhances student motivation, improves learning experiences, and contributes to better academic outcomes. It also highlighted that AI technologies help teachers monitor students' progress and provide personalized learning support.
5. Almufarreah, A. (2026). **Gamification in education and its impact on student academic performance: A conceptual model based on systematic literature review and PLS-SEM analysis.** *Algorithms*. This recent research developed a conceptual framework explaining how gamification influences student academic performance. The study found that gamification encourages participation, increases learner engagement, and improves overall learning outcomes. It emphasized that combining modern technologies such as AI with gamified strategies can further strengthen digital learning environments.

FINDINGS AND SUGGESTIONS:

SIMPLE PERCENTAGE:

PROFILE OF RESPONDENTS (N = 70)

Variable	Particulars	No. of Respondents	Percentage
Age	15–20 years	21	30
	21–25 years	24	34
	25–30 years	16	22.9
	Above 30 years	9	12.9
Gender	Male	26	37.1
	Female	44	62.9
Field of Study	Commerce	31	44.3
	Commerce with CA	6	8.6
	Computer Science	18	25.7

Variable	Particulars	No. of Respondents	Percentage
	Economics	15	21.4
Year of Study	First Year	23	32.9
	Second Year	31	44.3
	Third Year	16	22.9
Type of Education Learning	School	25	35.7
	College	45	64.3
Area of Residence	Urban	37	52.9
	Rural	7	10
	Semi-Urban	26	37.1
Use of AI Technology for Study	Rarely	35	50
	Sometimes	7	10
	Frequently	15	21.4
	Always	13	18.6
Concept of Gamification	Somewhat	10	14.3
	Little	13	18.6
	More	47	67.1
Awareness of AI Educational Tools	Yes	59	84.3
	No	11	15.7
Gamified Learning Methods	Points	23	32.9
	Badges	23	32.9
	Leaderboards	7	10
	Quests	5	7.1
	Timed Challenges	12	17.1
AI Features Interacted With	Adaptive Quizzes	36	51.4
	Feedback	18	25.7
	Predictive Analysis	16	22.9
AI Applications Preferred in Institutions	AI-Powered Tools	31	44.3
	Smart Classrooms	17	24.3
	VR/AR Learning	10	14.3
	Smart Assessment Software	12	17.1
Impact of AI on Education	To the core	25	35.71
	To some extent	34	48.6

Variable	Particulars	No. of Respondents	Percentage
	Not at all	11	15.71
Ethical Concerns about AI	Privacy of Data	9	12.9
	Data Security	30	42.9
	Lack of Human Interaction	14	20
	Reliability and Accuracy	8	11.4
	Job Displacement	9	12.9

GARRETT RANKING**TABLE 1****GARRETT'S RANKING TEST**

Frequency of the rank given by the consumers based on their perception

Particulars	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Chat GPT	9	8	5	6	3	8	10	3	3	3	3	3	3	3
Grammarly	6	8	8	3	5	4	6	6	7	5	4	2	3	3
Quilbot	8	7	9	5	8	4	4	3	3	5	3	4	3	4
Canva	7	6	7	10	8	3	4	1	4	6	4	4	3	3
Copilot	6	9	9	5	8	1	1	6	5	6	0	5	3	6
Quizlet	6	3	10	10	11	4	1	4	4	3	1	4	3	6
Course era	24	7	8	4	5	0	5	2	0	0	3	4	2	6
Tutor me	14	15	14	0	5	1	3	3	3	0	3	4	2	3
Eklavya	10	7	23	0	7	0	1	0	2	0	3	3	5	9
Duolingo	16	9	15	0	3	0	2	2	0	6	0	6	3	8
Thinkstermath	16	15	11	3	5	0	0	0	4	0	8	0	5	3
Open AI	15	8	12	7	3	1	0	0	0	4	3	2	6	9
Smart sparrow	10	11	15	5	11	0	0	0	0	1	3	0	6	8
Spoken tutorial	26	7	6	3	5	0	1	0	1	0	3	3	4	11

TABLE 2

S	PARTICULAR	FORMULA $100(R_{ij} - 0.5)/N$	PERCENT POSITION	SCORE
		$\frac{ij}{N}$		
	Chat GPT	$100(1-0.5)/14$	3.571428571	85
	Grammarly	$100(2-0.5)/14$	10.71428571	75
	Quilbot	$100(3-0.5)/14$	17.85714286	69
	Canva	$100(4-0.5)/14$	25	64
	Copilot	$100(5-0.5)/14$	32.14285714	60
	Quizlet	$100(6-0.5)/14$	39.28571429	56
	Course era	$100(7-0.5)/14$	46.42857143	52
	Tutor me	$100(8-0.5)/14$	53.57142857	49
	Eklavya	$100(9-0.5)/14$	60.71428571	45
	Duolingo	$100(10-0.5)/14$	67.85714286	42
	Thinkstermath	$100(11-0.5)/14$	75	37
	Open AI	$100(12-0.5)/14$	82.14285714	32
	Smart sparrow	$100(13-0.5)/14$	89.28571429	26
	Spoken tutorial	$100(14-0.5)/14$	96.42857143	16

TABLE 3

GARRETT RANKING

Particulars	1	2	3	4	5	6	7	8	9	10	11	12	13	14	TOTAL	GAR	RANK
Chat GPT	765	600	345	384	180	448	520	147	135	126	111	96	78	48	3983	39.83	9
Grammarly	510	600	552	192	300	224	312	294	315	210	148	64	78	48	3847	38.47	12
Quilbot	680	525	621	320	480	224	208	147	135	210	111	128	78	64	3931	39.31	10
Canva	595	450	483	640	480	168	208	49	180	252	148	128	78	48	3907	39.07	11
Copilot	510	675	621	320	480	56	52	294	225	252	0	160	78	96	3819	38.19	14
Quizlet	510	225	690	640	660	224	52	196	180	126	37	128	78	96	3842	38.42	13
Course era	2040	525	552	256	300	0	260	98	0	0	111	128	52	96	4418	44.18	1
Tutor me	1190	1125	966	0	300	56	156	147	135	0	111	128	52	48	4414	44.14	2
Eklavya	850	525	1587	0	420	0	52	0	90	0	111	96	130	144	4005	40.05	8
Duolingo	1360	675	1035	0	180	0	104	98	0	252	0	192	78	128	4102	41.02	6
Thinkstermath	1360	1125	759	192	300	0	0	0	180	0	296	0	130	48	4390	43.90	3
Open AI	1275	600	828	448	180	56	0	0	0	168	111	64	156	144	4030	40.30	7
Smart sparrow	850	825	1035	320	660	0	0	0	0	42	111	0	156	128	4127	41.27	5
Spoken tutorial	2210	525	414	192	300	0	52	0	45	0	111	96	104	176	4225	42.25	4

The Garrett Ranking table shows that Course Era secured first place with the highest Garrett average rank score of 44.18, suggesting that respondents highly prefer this platform for AI-supported educational learning and online courses. Tutor Me ranked second with score of 44.14 indicating the strong preference of respondents for personalized tutoring and academic assistance and third rank was obtained by Thinkster Math with score of 43.90 reflecting the respondents interest in Mathematics AI learning tool and Spoken Tutorial secures fourth rank with score of 42.5 highlighting the usefulness for learning program and skill development followed by Smart Sparrow, Duolingo, Open AI, Eklavya, Chat Gpt, Quilbot, Canva, Grammarly, Quizlet and Copilot. Thus, the analysis indicates that online learning platforms and AI-based tutoring systems are preferred as effective tools for enhancing knowledge and skills.

SUGGESTION

FOR SIMPLE PERCENTAGE ANALYSIS:

1. Educational institutions should increase awareness and training programs on AI tools to encourage students to use them more frequently for academic purposes.
2. Teachers and institutions should incorporate gamification elements such as points, badges, and challenges into teaching methods to enhance student engagement.
3. Colleges and schools should integrate AI-powered adaptive learning systems that provide personalised learning experiences for students.
4. Institutions should improve digital infrastructure, especially for rural and semi-urban students, to ensure equal access to AI-based learning technologies.
5. Proper data security and privacy measures should be implemented to address students' ethical concerns regarding AI usage.
6. Teachers should receive training in AI and gamified teaching methods to effectively implement these technologies in classrooms.
7. Educational policymakers should promote AI-enabled smart classrooms and digital learning platforms to improve interactive and student-centred learning.

FOR GARRETT RANKING:

1. Educational institutions should promote platforms like Coursera and Tutor Me, as they appear to be highly useful for students in improving their learning experience, so colleges and schools should encourage students to utilise such platforms for skill development and online courses.
2. Tools like Thinkstermath and Spoken Tutorial should be integrated into academic learning, especially for subjects that require practice and conceptual understanding, such as mathematics, programming, and technical skills.
3. Duolingo and Smart Sparrow should be promoted for language learning and adaptive learning environments. These tools help students learn in an interactive and personalised manner.
4. Awareness programs and training sessions should be conducted to familiarise students with AI-based learning tools such as OpenAI, Eklavya, and ChatGPT, so that students can effectively use them for academic purposes.

5. Lower-ranked tools such as Copilot, Grammarly, Canva, and Quizlet should still be encouraged, as they provide support in writing, design, and study preparation, even though students may currently be less aware of their full potential.
6. Educational institutions should integrate multiple AI-based learning platforms within their curriculum, allowing students to experience diverse digital learning tools that support personalised and gamified learning.
7. Workshops and digital literacy programs should be organised to help students understand the advantages of AI-powered educational technologies and improve their acceptance and usage.

CONCLUSION:

This study highlights that students increasingly respond positively to learning environments that incorporate interactive game elements—such as rewards, challenges, levels, and instant feedback—especially when these features are intelligently personalized through AI. The findings reveal that students' acceptance of such systems is influenced by factors including perceived usefulness, ease of use, technological readiness, and the relevance of game elements to academic content. Moreover, AI-driven adaptivity significantly enhances the learning experience by tailoring tasks and feedback to individual needs, thus sustaining engagement and reducing disengagement or boredom. Overall, the study concludes that combining gamification with AI-based personalisation creates a dynamic and learner-centred environment that fosters deeper participation, consistent motivation, and improved academic performance. As educational institutions move toward digital transformation, adopting these innovative strategies can help build more effective, inclusive, and engaging learning ecosystems that support diverse learners and prepare them for future challenges.

REFERENCES:

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