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THE IMPACT OF GAMIFICATION ON LEARNER ENGAGEMENT IN SKILL DEVELOPMENT TRAINING

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ABSTRACT
This study explored learners' perceptions, measured engagement levels, and evaluated the effectiveness of gamified training methodologies within skill development programs. Specifically, the research sought to answer how learners perceive the usability and relevance of gamified features, to quantify their emotional, behavioral, and cognitive engagement, and to assess the impact of these programs on knowledge retention and overall performance improvement. The methodology employed a descriptive quantitative research design, utilizing a structured survey instrument to gather data on the key study variables. The sample for the study consisted of 150 learners currently participating in skill development programs that utilize gamified training modules. Descriptive statistics were the primary analytical tool used to calculate means and standard deviations across multiple metrics, providing a detailed profile of learner perceptions, engagement levels, and the program's perceived effectiveness across various dimensions. Results indicate that while the gamified training is effective at stimulating curiosity, it struggles with core usability, quality of feedback, and emotional engagement. The overall impact is moderate, with high variability in learner experience. Strategic recommendations focus on prioritizing interface redesign and enhancing diagnostic feedback to remove structural barriers and drive deeper behavioral investment.
Keywords: Gamification, Learner Engagement, Skill Development, Training Effectiveness, Knowledge Retention, User Experience (UX).

INTRODUCTION

Gamification is increasingly recognized as a powerful strategy to enhance learner engagement in educational and training contexts. By integrating game elements such as points, badges, and leaderboards into learning environments, gamification aims to make learning experiences more interactive and motivating. In skill development programs, where learners often face repetitive tasks or complex concepts, gamification provides an opportunity to sustain interest and improve participation.

Learner engagement is a critical factor in achieving successful training outcomes. Engagement typically includes emotional and behavioural dimensions, reflecting how learners feel about the learning process and how actively they participate. Emotional engagement relates to positive feelings such as interest and enjoyment, while behavioural engagement involves observable actions like effort and participation. Understanding how gamification influences these dimensions is essential for designing effective training interventions.

Despite the growing popularity of gamification, its impact on different types of skill development programs remains underexplored. Programs such as vocational, technical, and soft skills training vary in content and delivery, which may affect how learners respond to gamified elements. This study addresses this gap by examining the influence of gamification on emotional and behavioural engagement across diverse training contexts. The findings aim to provide insights for educators and trainers to tailor gamification strategies for maximum effectiveness.

STATEMENT OF THE PROBLEM

Skill development training programs are essential for preparing individuals for employment and career growth, yet maintaining learner engagement remains a persistent challenge. Traditional training methods often fail to sustain interest and motivation, leading to reduced participation and lower learning outcomes. Gamification, which incorporates game-like elements into learning environments, is widely promoted as a solution to enhance engagement. However, its effectiveness across different types of skill development programs such as vocational, technical, and soft skills has not been fully understood. Without clear evidence on how gamification influences emotional and behavioural engagement in these varied contexts, trainers and organizations risk implementing strategies that may not yield optimal results. This study addresses this gap by examining the impact of gamification on learner engagement in diverse skill development programs.

SCOPE OF THE STUDY

This study focuses on two key dimensions of engagement (emotional and behavioural) across different skill development programs. The research is limited to participants enrolled in structured training sessions and does not extend to informal or self-paced learning environments. The study emphasizes the role of gamified elements

in influencing engagement but does not assess long-term learning outcomes or knowledge retention. Findings are intended to guide trainers and organizations in designing effective gamification strategies tailored to diverse skill development contexts.

REVIEW OF LITERATURE

Khaleel, F. L., Ashaari, N. S., & Wook, T. S. M. T. (2020) analyzed the student engagement in learning programming subjects and measuring the impact of game elements on student engagement. The research involved students enrolled in programming language courses, which were considered difficult subjects. Previous studies had shown that students dropped, failed, or withdrew from these courses at rates between 35% and 50%. The study applied gamification techniques by incorporating game elements into the learning process. A controlled experiment was conducted where students were exposed to gamified learning strategies, and their engagement levels were observed and measured. The results showed that the game elements had a positive effect on student engagement in the experiment group. The scores indicated that gamification improved participation and motivation compared to traditional learning approaches.

Gaonkar, S., Khan, D., Manisha, A. S., & Singh, A. (2022) examined recent scientific evidence on developing trends in technology education and gamification plugins, Various responses and observations were collected from employees in a controlled environment. The data focused on understanding their level of competency, social relatedness, meaningful task engagement, and decision-making freedom. The study analyzed existing literature on gamification in education and conducted observations in a controlled setting. Employees were monitored to assess behavioural patterns related to motivation, engagement, and social influence when exposed to gamified learning elements. The results indicated that gamification appealed to a wide range of learners by increasing motivation, engagement, and social impact. Observations revealed that game elements positively influenced competency, social relatedness, and decision-making freedom, suggesting that gamification could significantly enhance learning experiences.

Bouchrika, I., Harrati, N., Wanick, V., & Wills, G. (2021) investigated how gamification affected student learning engagement and the interactivity level with e-learning technologies. Data were collected over a period of 10 months from students using a gamified question board integrated with the university's e-learning portal, where the adoption of e-learning had previously been extremely poor. A gamified question board was designed and implemented to allow students to ask and answer questions related to their taught modules, with academic staff contributing and validating correct answers. The results indicated that gamification positively influenced sustained learning and improved participation in the e-learning environment.

Jayalath, J., & Esichaikul, V. (2022) analyzed the development of an operational model and gamification design to create blended e-Learning programs that embedded motivational and engagement strategies as an effective means of achieving learner success in the TVET context. Data were collected to assess the feasibility and viability of the gamified blended eLearning approach. The study applied a motivational framework based on attention, relevance, confidence, and satisfaction, along with an engagement design that included behavioural, emotional, and cognitive aspects. Fifteen game dynamics, relevant mechanics, and appropriate game components were proposed and embedded into the course using structural and content gamification. The results indicated that the gamification design and operational model were effective in motivating and engaging learners.

Smiderle, R., Rigo, S. J., Marques, L. B., Peçanha de Miranda Coelho, J. A., & Jaques, P. A. (2020) determined the effects of gamification on students' learning, behaviour, and engagement based on their personality traits in a web-based programming learning environment. Data were collected from 40 undergraduate students enrolled in first-year programming courses. An experiment was conducted over four months using a web-based programming learning platform. Students were divided into two groups: one using a gamified environment and the other using a non-gamified environment. Personality traits were assessed, and engagement, learning behaviour, and performance were monitored throughout the study. The results revealed that gamification affected students in distinct ways depending on their personality traits. Evidence indicated that the impact of gamification was not uniform but varied according to specific user characteristics, suggesting that personalization plays a critical role in gamified learning environments.

Hussein, E., Kan'An, A., Rasheed, A., Alrashed, Y., Jdaitawi, M., Abas, A., ... & Abdelmoneim, M. (2023) analyzed the effect of gamification in special education settings and aimed to identify gamification domains, groups, and trends for individuals with special needs through a comprehensive systematic literature review. Valuable data were gathered from published studies focusing on technology techniques used to enhance the skills of individuals with disabilities. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standard was adopted for inclusion and exclusion criteria. The results revealed that gamification design facilitated the development of various skills among individuals with special needs. However, the review also highlighted gaps in research, suggesting the need for further studies in unexplored areas of gamification for special education.

Smirani, L., & Yamani, H. (2024) investigated the impact of gamification techniques, including Kahoot!, Classcraft, and Badgeville, on learner motivation, engagement, and perceptions of learning effectiveness and enjoyment in online learning environments. Employing a quantitative research approach, the study utilized SEM to analyse the relationships between gamification elements and learner outcomes, framed by Self-Determination Theory (SDT). Data collected from a survey of 169 academics across various fields revealed that gamification

techniques, such as leaderboards, badges, points systems, and challenges, significantly enhance learner engagement, with an average increase of 25% observed. Rewards, incentives, and competitive challenges boost both intrinsic and extrinsic motivation, leading to a 30% improvement in learner performance. The results showed that designing gamified e-learning environments that effectively integrate gamification elements to enhance engagement, motivation, and knowledge retention, offering evidence-based guidance for educators aiming to create engaging and effective online learning experiences.

Kulkarni, P., Gokhale, P., Satish, Y. M., & Tigadi, B. (2022) investigated gamification-based training programs through the lens of self-determination theory in the context of corporate training. It aimed to integrate self-determination theory, game elements, and learning outcomes in gamified training programs to derive insights. Data were sourced from software development companies operating in Bangalore, India. The study collected perceptions from trainers and human resource managers regarding game-based training programs. PLS-SEM was applied to examine the relationship between self-determination theory and game elements and their impact on learning outcomes. The study also analyzed the perceptions of organizational stakeholders as a precursor to developing a game-like learning ecosystem. The results revealed that game-based learning made corporate training more engaging, immersive, and contextual for learners. The results indicated that integrating game elements with self-determination principles positively influenced motivation and learning outcomes.

OBJECTIVES OF THE STUDY

- To explore learners' perceptions of gamified skill development programs.
- To measure the engagement levels of learners in skill development programs using gamified training methodologies.
- To evaluate the effectiveness of gamified training in improving knowledge retention and performance among learners.
- To suggest best practices for integrating gamification into skill development programs to maximize learner engagement and effectiveness.

RESEARCH METHODOLOGY

Research Type: Descriptive

Data Collection

Primary Data: The primary data were collected from learners enrolled in various skill development training programs through a structured questionnaire.

Secondary Data: Secondary data were obtained from existing literature, including published journals, research papers on gamification and learner engagement, industry reports, and online academic sources.

Sampling Type: Convenience Sampling

Sampling Universe: The sampling universe consisted of participants from recognized skill development training centres who had experience with gamified learning environments.

Sample Size: 150 respondents.

Statistical Tools Used: Percentage Analysis, Descriptive Statistics, One-Way ANOVA

LIMITATIONS OF THE STUDY

- Gamification elements were assessed in general terms without analyzing the impact of specific game mechanics individually.
- External factors such as trainer quality, institutional resources, and learner demographics were not controlled.
- The study does not measure long-term effects of gamification on performance or career outcomes.

DATA ANALYSIS AND INTERPRETATION

PERCENTAGE ANALYSIS

Demographic Variables of the Respondents

Demographic Variables	Particulars	Frequency	Percent
Age	Below 20 Years	23	15.3
	21–30 Years	41	27.3
	31–40 Years	37	24.7
	41–50 Years	33	22.0
	Above 50 Years	16	10.7
Gender	Male	83	55.3
	Female	67	44.7
Educational Qualification	High School	37	24.7
	Diploma	40	26.7
	Undergraduate	25	16.7
	Postgraduate	30	20.0
	Other	18	12.0
Employment Status	Unemployed and seeking training for job	42	28.0

	Self-employed/Entrepreneur	41	27.3
	Currently employed	28	18.7
	Student	39	26.0
Region/Location	Metro City	24	16.0
	Urban	39	26.0
	Semi-Urban	37	24.7
	Rural	50	33.3
Access to Digital Devices	Smartphone	23	15.3
	Laptop/Desktop	53	35.3
	Tablet	49	32.7
	None	25	16.7
	Total	150	100.0

Among the 150 respondents, 15.3% were below 20 years, 27.3% were aged 21–30 years, 24.7% were between 31–40 years, 22% were in the 41–50 years category, and 10.7% were above 50 years. The gender distribution revealed that, 55.3% were males and 44.7% were females. 24.7% had completed high school, 26.7% held a diploma, 16.7% had an undergraduate degree, 20% possessed a postgraduate degree, and 12% with other qualifications.

Employment categories included unemployed and seeking training (28%), self-employed/entrepreneurs (27.3%), currently employed (18.7%), and students (26%). 16% were located in metro cities, 26% in urban areas, 24.7% in semi-urban regions and 33.3% are residing in rural areas. Device ownership showed that 35.3% had laptops/desktops, 32.7% had tablets, 15.3% had smartphones, and 16.7% reported no device access.

Gamification and Training Experience of the Respondents

Gamification and Training Experience	Particulars	Frequency	Percent
Prior Experience with Online Learning	Yes	83	55.3
	No	67	44.7
Familiarity with Gamification	High	19	12.7
	Moderate	69	46.0
	Low	27	18.0
	None	35	23.3
Which gamification features did you find most engaging?	Points/Rewards	42	28.0
	Badges/Achievements	41	27.3
	Leaderboards/Rankings	28	18.7
	Interactive Quizzes	39	26.0
Type of Skill Development Program	Technical	24	16.0
	Vocational	46	30.7
	Soft Skills	43	28.7
	Others	37	24.7
Mode of Training Attended	Online	49	32.7
	Offline	39	26.0
	Hybrid	62	41.3
	Total	150	100.0

Among the 150 respondents, 55.3% reported prior experience with online learning, and 44.7% had no such experience. 12.7% reported high familiarity, 46% with moderate familiarity, 18% had low familiarity, and 23.3% with no familiarity towards gamification elements.

Of 150 respondents, 28% selected points/rewards, 27.3% proposed badges/achievements, 18.7% chose leaderboards/rankings, and 26% indicated interactive quizzes as most engaging gamification features. Participation was distributed across technical programs (16%), vocational training (30.7%), soft skills programs (28.7%), and other programs (24.7%). Training modes included online (32.7%), offline (26%), and hybrid (41.3%), with hybrid formats being the most common among respondents.

Descriptive Statistics for the Learners' Perceptions of Gamified Skill Development Programs

Particulars	N	Mean	SD
The gamified interface and tools were easy to navigate and understand.	150	2.83	1.512
I found it simple to track my progress (e.g., viewing points, level-ups) in the program.	150	3.11	1.364
The rules and objectives of the gamified elements were clear and straightforward.	150	3.37	1.287
The gamified training provided immediate and constructive feedback on my performance.	150	3.23	1.434

The gamified program helped to remember the concepts better than a traditional method.	150	2.91	1.348
The challenges felt relevant and related to the skills for a job.	150	3.28	1.471
Valid N (list wise)	150		

The above table indicates that the respondents disagree with the easy navigation and understandability of gamified interfacing and tools (2.53), and gamified program helps to remember the concepts better than a traditional method (2.91). The respondents agree with the simplicity in tracking the progress in the program (3.11), clear and straightforward rules of the gamified elements (3.37), gamified training provide immediate and constructive feedback on their performance (3.23) and challenges felt relevant and related to the skills for a job (3.28).

Descriptive Statistics for the Learner Engagement in Gamified Skill Development

Particulars	N	Mean	SD
Emotional Engagement			
I feel excited and look forward to using the gamified training platform.	150	2.81	1.449
I feel proud and satisfied when I achieve milestones or complete challenges in the program.	150	2.89	1.412
I enjoy the competition and social interaction aspects of the training with my peers.	150	2.96	1.225
Behavioral Engagement			
I consistently spend extra time on the learning modules beyond requirements.	150	2.99	1.258
I actively participate in optional activities, quizzes, and discussions related to the training.	150	2.94	1.512
I make a conscious effort to complete all levels or challenges presented in the course.	150	3.21	1.333
Cognitive Engagement			
I try to think deeply about the concepts and how to apply them in a job setting.	150	2.93	1.238
I review my mistakes in the gamified exercises to adjust my strategy and improve my performance.	150	2.94	1.254
The training stimulates curiosity and makes me to search for more information on the topic.	150	3.70	1.186
Valid N (list wise)	150		

The above table indicates that the respondents disagree with the excitement in using the gamified training platform (2.81), satisfaction in achieving milestones or complete challenges in the program (2.89), enjoyment in the competition and social interaction aspects of the training with their peers (2.96), consistently spend extra time on the learning modules beyond requirements (2.99), actively participating in optional activities, quizzes, and discussions related to the training (2.94), making deep thinking about the concepts and how to apply them in a job setting (2.93) and reviewing the mistakes to adjust the strategy and improve their performance in the gamified exercises (2.94). The respondents agree with making a conscious effort to complete all levels or challenges in the course (3.12) and training stimulates curiosity and search for more information on the topic (3.70).

Descriptive Statistics for the Effectiveness of Gamified Training Program on Knowledge Retention and Performance among Learners

Particulars	N	Mean	SD
I remembered the key concepts for a longer time after the gamified training.	150	2.91	1.220
The gamified activities helped me reinforce my learning better than reading a textbook.	150	2.99	1.212
Recalling information during quizzes or assessments was easier because of the gamified format.	150	2.99	1.198
The training improved my confidence in applying the learned skills.	150	2.91	1.348
I can handle training-related assignments with greater effectiveness.	150	3.28	1.471
The immediate feedback from the game mechanics helped to correct my mistakes quickly, leading to better performance.	150	2.81	1.449
Valid N (list wise)	150		

The above table indicates that the respondents disagree with gamified training helps to remember the key concepts for a longer time (2.91), helped to reinforce their learning better than reading a textbook (2.99), easy information recall during quizzes or assessments (2.99), improvements in the confidence of applying the learned skills (2.91) and quick correction in their mistakes due to immediate feedback from the game mechanics (2.81). The respondents agree with the effectiveness of handling training-related assignments (3.28).

Comparison between the Demographic Variables (Employment Status) of the Respondents and Various Dimensions

Ho1: There is a substantial link between the demographic variables (employment status) of the respondents and various dimensions.

Dimensions	Employment Status	N	Mean	SD	F	Sig
Learners' Perceptions of Gamified Skill Development Programs	Unemployed and seeking training for job	42	3.25	1.032	1.179	0.320
	Self-employed/Entrepreneur	41	3.25	1.037		
	Currently employed	28	3.03	0.904		
	Student	39	2.91	0.961		
	Total	150	3.12	0.994		
Emotional Engagement	Unemployed and seeking training for job	42	3.01	0.767	0.544	0.653
	Self-employed/Entrepreneur	41	2.89	0.933		
	Currently employed	28	2.76	0.850		
	Student	39	2.85	0.753		
	Total	150	2.89	0.824		
Behavioral Engagement	Unemployed and seeking training for job	42	3.25	0.769	1.468	0.226
	Self-employed/Entrepreneur	41	3.03	0.921		
	Currently employed	28	3.01	0.772		
	Student	39	2.86	0.826		
	Total	150	3.04	0.832		
Cognitive Engagement	Unemployed and seeking training for job	42	3.36	0.704	2.420	0.069
	Self-employed/Entrepreneur	41	3.21	0.595		
	Currently employed	28	2.92	0.724		
	Student	39	3.18	0.679		
	Total	150	3.19	0.683		
Effectiveness of Gamified Training Program on Knowledge Retention and Performance among Learners	Unemployed and seeking training for job	42	3.08	0.578	1.653	0.180
	Self-employed/Entrepreneur	41	3.07	0.576		
	Currently employed	28	2.81	0.582		
	Student	39	2.91	0.632		
	Total	150	2.98	0.596		

There is a substantial link between the learners' perceptions of gamified skill development programs (0.320), emotional engagement (0.653), behavioural engagement (0.226), cognitive engagement (0.069), effectiveness of gamified training program on knowledge retention and performance among learners (0.180) and the employment status of the respondents.

Comparison between the Gamification and Training Experience (Type of Skill Development Program) of the Respondents and Various Dimensions

Ho1: There is a substantial link between the gamification and training experience (type of skill development program) of the respondents and various dimensions.

Dimensions	Type of Skill Development Program	N	Mean	SD	F	Sig
Learners' Perceptions of Gamified Skill Development Programs	Technical	24	3.15	1.012	0.317	0.813
	Vocational	46	3.01	1.007		
	Soft Skills	43	3.15	1.040		
	Others	37	3.21	0.939		
	Total	150	3.12	0.994		
Emotional Engagement	Technical	24	2.68	0.726	2.783	0.043
	Vocational	46	3.11	0.924		
	Soft Skills	43	2.96	0.784		
	Others	37	2.66	0.731		
	Total	150	2.89	0.824		
Behavioural Engagement	Technical	24	2.90	0.831	3.197	0.025
	Vocational	46	2.79	0.850		
	Soft Skills	43	3.26	0.800		
	Others	37	3.21	0.775		
	Total	150	3.04	0.832		
Cognitive Engagement	Technical	24	3.31	0.581	1.492	0.219

	Vocational	46	3.02	0.649		
	Soft Skills	43	3.21	0.705		
	Others	37	3.30	0.740		
	Total	150	3.19	0.683		
Effectiveness of Gamified Training Program on Knowledge Retention and Performance among Learners	Technical	24	2.98	0.561	0.134	0.940
	Vocational	46	2.99	0.616		
	Soft Skills	43	2.94	0.619		
	Others	37	3.03	0.587		
	Total	150	2.98	0.596		

There is a substantial link between the learners' perceptions of gamified skill development programs (0.813), cognitive engagement (0.219), effectiveness of gamified training program on knowledge retention and performance among learners (0.940) and the type of skill development program of the respondents. There is no substantial link between the emotional engagement (0.043), behavioural engagement (0.025) and the type of skill development program of the respondents.

Emotional Engagement

Vocational programs showed the highest emotional engagement (3.11), and leaning toward agreement. Soft skills programs (2.96), technical (2.68) and other programs (2.66) trending toward disagreement. This suggests that vocational training tends to evoke more positive emotional responses compared to technical or other programs, though post hoc tests are needed to confirm specific differences.

Behavioural Engagement

Soft skills programs (3.26) and other programs (3.21) demonstrated higher engagement, indicating stronger participation and effort. In contrast, technical (2.90) and vocational programs (2.79) were trending toward disagreement. These findings imply that soft skills and custom programs are more effective in promoting active learning behaviours than technical or vocational tracks, although further analysis through post hoc comparisons is required.

FINDINGS

Demographic Variables of the Respondents

Most of the respondents were male. Most of the respondents were in the 21–30 years category. Most of the respondents had completed diploma. Most of the respondents were unemployed and seeking training for jobs. Most of the respondents were located in urban areas. Most of the respondents had access to laptops/desktops for gamified learning.

Gamification and Training Experience of the Respondents

Most of the respondents had prior experience with online learning. Most of the respondents reported moderate familiarity with gamification. Most of the respondents found points/rewards as the most engaging gamification features. Most of the respondents participated in vocational skill development programs. Most of the respondents attended hybrid training sessions.

SUGGESTIONS

❖ The gamified interface should be simplified to improve navigation ease and understanding.
❖ The system should clearly articulate the meaning and value of points and badges, explaining how these metrics directly correlate to the mastery of specific skills or competencies.
❖ Challenges should shift toward authentic, scenario-based tasks that require learners to apply concepts in simulated, real-world job contexts rather than relying solely on simple knowledge recall.
❖ The immediate feedback must be improved by providing specific, targeted explanations for errors, guiding the learner toward the correct understanding rather than just labeling the answer as incorrect.
❖ Gamified training might ensure that milestone completions are accompanied by highly visible, personalized celebrations to amplify feelings of pride and satisfaction.
❖ Gamified training should increase the participation rate in optional activities by clearly linking them to tangible in-game benefits, such as powerful resources or exclusive content unlocks.
❖ Gamified training must explicitly guide learners to actively review their failures by offering "Retry with Hints" options and providing analytical summaries of conceptual errors to promote self-correction.
❖ Gamified training quizzes and assessments should be designed with contextual clues or memory triggers built into the game environment itself, making it easier for learners to recall information under pressure.
❖ Gamified training must introduce more realistic simulation challenges that require learners to apply skills under varying conditions and time pressures, substantially boosting their confidence in real-world application.
❖ Gamified training must drastically improve the quality of its immediate feedback by making it highly descriptive, diagnostic, and prescriptive, clearly explaining why an error occurred and how to correct it, which is essential for better performance.
❖ Gamified training should implement "instant reset" or "rewind" mechanics following an error, allowing the learner to immediately apply the corrective feedback in the same context without penalty to encourage rapid, low-stakes mistake correction.

❖ Gamified training should integrate a "Mistake Log" or "Error Analysis" dashboard that tracks and summarizes the learner's most common errors, guiding focused review and leading to faster and more lasting performance improvement.

CONCLUSION

The study indicates that the gamified training program is perceived as moderately engaging and effective. The most critical area that need immediate and substantial enhancement is the user experience (UX), specifically the ease of interface navigation and understanding and the quality of immediate feedback. These foundational issues—usability and timely correction—are likely hindering the learner's ability to fully appreciate and benefit from the other gamified elements. Furthermore, the consistently high variability across all metrics points to a significant inconsistency in learner experience; some learners find the program highly effective and engaging, while a substantial portion does not, necessitating an investigation into why the experience is polarized.

Analysis of the engagement data reveals a particular weakness in the emotional and behavioral dimensions, with scores for excitement, pride, and spending extra time being notably low. This signals that the program's rewards, social mechanics, and overall presentation are failing to generate strong internal motivation or compelling emotional investment. In terms of learning effectiveness, there is a struggle with knowledge retention and concept reinforcement; learners are not strongly convinced that the gamified method aids long-term recall better than traditional methods. The connection between the gamified activities and the transfer of learning to real-world job skills, while better perceived, still needs stronger, more explicit links through authentic scenario-based challenges to maximize its perceived value and build genuine confidence in skill application.

To maximize the positive impact of gamification on learner engagement, the focus must shift from merely adding game elements to optimizing the foundational user experience. The program must prioritize strategic improvements to usability and feedback quality to ensure that curiosity is met with a smooth, rewarding, and corrective learning path. By removing friction in navigation and implementing highly diagnostic and personalized feedback, the training can convert intellectual interest into consistent behavioral engagement and measurable performance improvement. This strategic intervention will stabilize the learning environment, reduce the high variability in learner outcomes, and enable the gamified mechanics to finally deliver the intended high-impact engagement and skill development.

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