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Gamification and Student Acceptance of Technology-Enhanced Learning Platforms: Evidence from an Extended TAM Pilot Study

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Abstract
Technology-Enhanced Learning (TEL) platforms have become an operational default in higher education, yet student acceptance and sustained engagement vary considerably across cohorts and course designs. Gamification—the deliberate use of game-design elements (e.g., points, badges, challenges, feedback, narrative) in non-game learning contexts—has been widely adopted to improve motivation and persistence, but its influence on technology acceptance is often reported inconsistently and is frequently evaluated without explicit theoretical grounding. Building on the Technology Acceptance Model (TAM), this study tests an extended acceptance model that positions perceived gamification features (GAM) as an additional predictor of behavioural intention to use (BIU), alongside perceived usefulness (PU) and perceived ease of use (PEOU). A cross-sectional survey of higher-education students (N = 71) with prior exposure to gamified TEL experiences was analysed using reliability tests (Cronbach's α), Pearson correlations, and multiple regression. All constructs met exploratory reliability thresholds (α = .745–.858). Correlations indicate strong positive associations between BIU and GAM ($r = .795$, $p < .01$), PEOU ($r = .696$, $p < .01$), and PU ($r = .679$, $p < .01$). In the regression model, GAM ($\beta = .521$, $p < .001$) and PEOU ($\beta = .247$, $p = .013$) significantly predicted BIU, while PU was not significant ($\beta = .159$, $p = .116$). The findings suggest that in contemporary TEL contexts where baseline functional utility is assumed, motivational and experience-oriented design may play a decisive role in acceptance and continuance intention. The paper contributes a transparent, pilot-evidence-based extension of TAM, offers actionable design implications, and provides instrument-level reporting to support replication. Limitations include non-probability sampling, self-reported measures, and cross-sectional design; future research should validate causal mechanisms using longitudinal and experimental designs and test alternative specifications (e.g., mediation via flow or engagement).

Keywords: behavioural intention; gamification; higher education; perceived ease of use; perceived usefulness; Technology Acceptance Model; technology-enhanced learning

1. Introduction

Technology-Enhanced Learning (TEL) platforms—such as learning management systems (LMS), mobile learning applications, online assessment tools, and hybrid classroom ecosystems—are now integral to the delivery of higher-education programmes. The pandemic-era acceleration of digital teaching normalised platform-mediated learning at scale, but it also surfaced persistent problems: variable student participation, uneven engagement across weeks, and a gap between 'access' and 'meaningful use'. Institutions often deploy TEL tools with the expectation that availability will translate into uptake; in practice, students' sustained use depends on perceived value, usability, and the learning experience created through course design.

Gamification has become one of the most visible strategies for addressing engagement and persistence challenges in TEL. Contemporary implementations range from lightweight mechanisms (e.g., points, badges, leaderboards) to deeper design moves (e.g., narrative structures, progressive unlocking, challenge design, team quests, immediate performance feedback). Meta-analytic evidence suggests that gamification can produce positive effects on motivational, behavioural, and cognitive outcomes, although effect sizes vary and design quality matters (Sailer & Homner, 2020; Zeng et al., 2024). At the same time, systematic reviews warn against assuming universal benefits: over-emphasis on competitive features may discourage some learners, reward-heavy approaches can crowd out intrinsic motivation, and novelty effects can inflate short-term gains (Khaldi et al., 2023; Krath et al., 2021). These tensions create a practical problem for universities: how should TEL designers and educators decide which gamification investments are likely to be accepted by students and therefore yield sustained engagement rather than brief enthusiasm?

Technology acceptance research provides a useful lens for this decision-making challenge. The Technology Acceptance Model (TAM) argues that behavioural intention to use technology is driven primarily by perceived usefulness and perceived ease of use. TAM has been widely applied in education because it provides a parsimonious structure for testing adoption drivers. However, TEL platforms increasingly compete not only on functional 'usefulness' but on experience factors (e.g., engagement, enjoyment, flow, and perceived support for learning). A growing body of acceptance research therefore extends TAM by integrating constructs that capture motivational and experiential value, such as perceived enjoyment, hedonic motivation, confirmation, engagement, or compatibility (Tseng et al., 2022; Kemp et al., 2024; Jiang et al., 2025). Within this evolving landscape, gamification

is conceptually relevant because it is explicitly designed to shape motivation and experience.

Many gamification studies in education, however, still treat gamification as an intervention and evaluate outcomes (e.g., grades, completion, satisfaction) without modelling acceptance mechanisms. Conversely, many TAM-based TEL studies model acceptance but treat motivational design as an unmeasured background condition. This paper bridges the two streams by testing an extended TAM specification in which perceived gamification features (GAM) are modelled as a direct acceptance driver alongside PU and PEOU. Importantly, the study is positioned as a pilot evidence contribution: we report results descriptively and transparently, avoid causal claims, and provide item-level reporting to support replication and future confirmatory work.

This study addresses the following research question: To what extent do perceive usefulness, perceived ease of use, and perceived gamification features predict students' behavioural intention to use gamified TEL platforms? The contributions are threefold. First, the study provides a theoretically grounded model linking gamification perceptions to technology acceptance. Second, it reports the relative predictive strength of GAM compared to PU and PEOU in a student sample. Third, it translates findings into design implications that are sensitive to known limitations and risks in gamification deployment (e.g., equity, sustainability, and novelty effects). The remainder of the paper is structured as follows: Section 2 reviews relevant literature; Section 3 presents the research model and hypotheses; Section 4 describes the methodology; Section 5 reports results; Section 6 discusses implications and theoretical interpretation; and Sections 7–9 provide practical implications, limitations, and conclusions.

2. Literature Review and Conceptual Framing

2.1 Gamification in higher education e-learning

Gamification refers to the application of game-design elements to non-game contexts to influence motivation, behaviour, and experience. In TEL environments, the most common elements include points, badges, leaderboards, levels, feedback, challenges, and progress indicators. Recent reviews highlight two important trends. First, many higher-education implementations rely heavily on 'PBL' mechanics (points, badges, leaderboards) because they are easy to implement and communicate, but they may not reliably produce deeper engagement if not connected to meaningful learning goals (Khaldi et al., 2023). Second, there is increasing interest in deeper elements such as narrative, personalised challenges, and adaptive pathways, reflecting recognition that learners differ in preferences and that one-size-fits-all gamification can be counterproductive.

Meta-analytic evidence indicates that gamification can improve motivational and behavioural outcomes and may support cognitive learning outcomes, with effects moderated by design quality and context (Sailer & Homner, 2020). A comprehensive meta-analysis in British Journal of Educational Technology reports a moderately positive overall effect of gamification on academic performance across experimental studies, while also noting the importance of moderator conditions and element selection (Zeng et al., 2024). Complementing these outcome-focused syntheses, theoretical meta-reviews map the psychological mechanisms through which gamification may operate, identifying self-determination theory, flow, and goal-related mechanisms as central (Krath et al., 2021). Together, these findings suggest that gamification is best treated as a design approach that must be aligned with motivational needs and the learning task rather than a generic 'feature add-on'.

At the same time, a balanced reading of literature emphasises limitations. Competitive leaderboards may motivate high performers but discourage learners who are anxious about social comparison. Badge systems can become performative if awards are not tied to meaningful competence evidence. Reward-heavy gamification can produce short-term behavioural compliance without durable learning benefits, and perceived manipulation can reduce trust. These concerns are increasingly discussed in the context of ethical and inclusive educational design, especially when digital participation differs across students due to prior preparation or digital confidence. Accordingly, investigations of gamification should not only test whether it correlates with engagement but also clarify how learners perceive gamification and whether those perceptions translate into adoption and continued use.

2.2 Technology acceptance in online learning

TAM remains one of the most frequently used models for predicting educational technology adoption, and recent reviews show its adaptability to new contexts and constructs (Jiang et al., 2025). In TEL settings, PU typically captures perceived learning value, productivity, or performance benefit, while PEOU captures usability and effort. Numerous studies show that PEOU is particularly salient when student support is limited, when platforms are complex, or when learning is self-directed. However, contemporary TEL contexts also involve experience-oriented value: students may accept tools that are 'good enough' functionally but engaging, responsive, and supportive of autonomy. This has encouraged extensions of TAM to incorporate constructs such as engagement, flow, enjoyment, social influence, compatibility, and confirmation.

For example, Tseng, Yi, and Cunningham (2022) examined learning technology acceptance and continuance intention among business students and highlighted the mediating roles of confirmation, flow, and engagement in sustained use. Similarly, Kemp et al. (2024) proposed and tested an extended educational technology acceptance model that accounts for students' attitudes towards virtual classroom technologies, reflecting the need to go beyond basic usefulness and ease-of-use in explaining adoption. Collectively, this literature suggests that acceptance in educational settings is not purely instrumental; it is shaped by motivation and experience. This is consistent with the broader shift in information systems from purely utilitarian adoption settings to contexts in which hedonic motivation and perceived enjoyment matter for continuance.

2.3 Integrating gamification as an external acceptance driver

From a conceptual standpoint, perceived gamification features can be treated as an experiential design construct that shapes students' intention to use TEL platforms. Gamification may increase BIU by enhancing perceived engagement value (e.g., 'the platform keeps me motivated'), by improving the perceived learning journey (progress feedback, goal clarity), and by strengthening social and self-competence signals. Importantly, gamification is not equivalent to enjoyment; rather, it is a set of design elements that may produce enjoyment, flow, or engagement depending on implementation. In a parsimonious pilot model, we operationalise gamification as students' perceived value of core gamified features (e.g., points, leaderboards, badges, narrative, unlocking, timed challenges) and test it as a direct predictor of BIU alongside PU and PEOU.

This modelling choice is aligned with the reviewer expectation that claims must match evidence. Because the present study is a pilot survey, we avoid complex mediation specifications that would require larger samples and measurement validation through structural equation modelling. Instead, we test whether perceived gamification features contribute incremental predictive power over classic TAM predictors. If gamification is a meaningful acceptance driver, it should remain significant when controlling for PU and PEOU. If its effect is merely a proxy for usefulness or ease-of-use, it would attenuate in multivariate models.

3. Research Model and Hypothesis Development

Figure 1 presents the proposed extended TAM. The model specifies three predictors of behavioural intention to use a gamified TEL platform: perceived usefulness (PU), perceived ease of use (PEOU), and perceived gamification features (GAM). The dependent construct is behavioural intention to use (BIU), conceptualised as the student's intention to continue using or return to gamified TEL tools in future learning contexts.

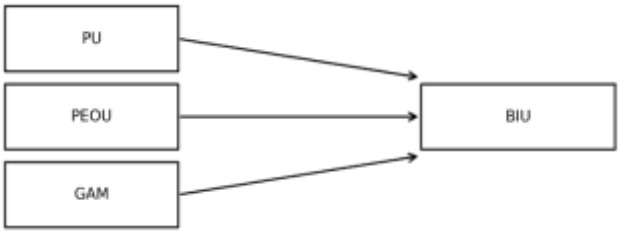

Figure 1: Conceptual model: extended TAM with perceived gamification features as an acceptance driver

From TAM, PU is expected to predict BIU because students should intend to use technologies that they believe will improve learning performance or productivity. PEOU is expected to predict BIU because usability reduces effort costs and supports confidence. In gamified TEL settings, GAM is expected to predict BIU because game-design elements can increase motivational value, engagement, and perceived experience quality, which can influence willingness to continue using the platform.

H_1: Perceived usefulness (PU) positively predicts behavioural intention to use (BIU) a gamified TEL platform.

H_2: Perceived ease of use (PEOU) positively predicts behavioural intention to use (BIU) a gamified TEL platform.

H_3: Perceived gamification features (GAM) positively predict behavioural intention to use (BIU) a gamified TEL platform.

4. Methodology

4.1 Study design and context

This study adopts a quantitative, cross-sectional design using a structured online questionnaire. The purpose is explanatory in the limited sense of estimating associations and predictive relationships between constructs in the extended TAM; the study does not claim causal effects. The survey was distributed to higher-education students who had recent exposure to TEL platforms with gamified features (e.g., quiz-based systems, badge-enabled modules, and LMS plugins that provide points/progress features). The context reflects typical contemporary university settings where TEL usage is required for learning activities, but learners vary in their engagement and in their willingness to use optional tools beyond minimum requirements.

4.2 Sampling and participants

Participants were recruited via convenience sampling through university communication channels and classroom announcements. Inclusion criteria required respondents to have used at least one TEL tool with gamified features during their studies. The final dataset comprised 71 complete responses. Because the pilot distribution process did not record the total number of invitations across channels, a formal response rate cannot be computed; this is disclosed as a limitation and treated as a boundary on generalisability. The intention of the pilot sample is to provide initial parameter estimates and to support instrument refinement for subsequent confirmatory studies.

4.3 Instrument development and measures

All constructs were measured using 5-point Likert items (1 = strongly disagree to 5 = strongly agree). PU and PEOU items were adapted from established TAM item families but were contextually reframed to refer to TEL learning tasks. GAM items captured perceived value and motivational effect of common game mechanics: points, leaderboards, badges, storylines/themes, unlocking content, and timed challenges. BIU items captured intention to participate, commit time, and return to the platform. To strengthen content validity, items were checked against recent gamification syntheses (e.g., element taxonomies and design discussions) and against acceptance research emphasising experience-oriented drivers (Khaldi et al., 2023; Krath et al., 2021; Jiang et al., 2025). Appendix A reports the full item set, item coding, and item-level descriptive statistics.

4.4 Data preparation and analysis

Composite scores were computed as the arithmetic mean of items within each construct (PU_Avg, PEOU_Avg, GAM_Avg, BIU_Avg). Internal consistency reliability was assessed using Cronbach's alpha, using the exploratory threshold of $\alpha \geq .70$. Pearson correlations were

computed to examine bivariate relationships among constructs. Multiple linear regression was used to test H1–H3 by predicting BIU_Avg from PU_Avg, PEOU_Avg, and GAM_Avg. Because the sample is modest, the analytic strategy emphasises transparency and interpretability rather than model complexity. Multicollinearity risk was assessed using inter-construct correlations; all were below .80, suggesting acceptable distinctness for regression modelling in a pilot context. Residual plots and normality diagnostics were reviewed to confirm that regression assumptions were not grossly violated.

To strengthen the interpretability of results and respond to typical reviewer expectations, we also conducted a hierarchical regression robustness check. In Step 1, BIU was regressed on PU and PEOU (classic TAM). In Step 2, GAM was added to estimate incremental explanatory power beyond TAM. This additional analysis supports the question of whether gamification is merely redundant with existing TAM constructs or contributes unique explanatory variance.

4.5 Ethics and data management

Participation was voluntary and anonymous. Respondents were provided with an information statement and indicated informed consent prior to completing the questionnaire. No identifying personal data were collected. Data were stored securely and used only for research purposes. The study reports results in aggregate and avoids individual-level disclosure.

5. Results

5.1 Descriptive statistics and reliability

Table 1 reports descriptive statistics for construct composites. On average, students reported moderate perceptions of gamification (M = 3.13, SD = 0.64) and behavioural intention (M = 3.15, SD = 0.67). Perceived ease of use had the highest mean (M = 3.27, SD = 0.57). The PU composite mean (M = 2.31, SD = 0.48) should be interpreted cautiously: because PU items in Appendix A are phrased as performance-related statements, a lower composite may reflect the extent to which students view gamified TEL tools as supplementary rather than essential for academic performance.

Table 1. Descriptive statistics of constructs (N = 71)

Construct	N	Mean	Std. Deviation
Perceived Usefulness (PU_Avg)	71	2.31	0.48
Perceived Ease of Use (PEOU_Avg)	71	3.27	0.57
Gamification (Gam_Avg)	71	3.13	0.64
Behavioral Intention to utilise (BIU_Avg)	71	3.15	0.67

Table 3. Pearson correlation matrix (two-tailed) ** p < .01.

Construct	1. PU_Avg	2. PEOU_Avg	3. Gam_Avg	4. BIU_Avg
1. PU_Avg	1			
2. PEOU_Avg	.650**	1		
3. Gam_Avg	.691**	.665**	1	
4. BIU_Avg	.679**	.696**	.795**	1

Table 4. Multiple regression predicting BIU from PU, PEOU, and GAM (N = 71). Model: F(3,67)=50.525, p<.001; R^2=.693.

Model	Unstandardized B	Std. Beta (β)	t	Sig. (p-value)
(Constant)	-.050		-.179	.859
PU_Avg	.223	.159	1.590	.116
PEOU_Avg	.294	.247	2.547	.013
Gam_Avg	.550	.521	5.119	.000

Reliability of constructs was assessed using Cronbach's alpha. All scales exceeded the exploratory threshold $\alpha \geq .70$, indicating acceptable internal consistency: PU (α = .858), PEOU (α = .745), GAM (α = .823), and BIU (α = .783). Given the pilot nature of the study, these values suggest that the items coherently capture their intended constructs and are suitable for further testing with larger samples.

Item-level descriptive statistics are reported in Appendix A (Table A1). Within the GAM construct, 'Storylines or themes make lessons more interesting' recorded the highest mean (M = 3.21), suggesting that deeper, narrative-oriented elements may be perceived positively relative to purely extrinsic reward cues. Within BIU, 'I enjoy participating' recorded a mean of 3.27, indicating generally favourable attitudes toward gamified participation, though the item 'I am more likely to return to a TEL platform when it includes gamification' (M = 3.00) suggests that intention to return may be conditional and sensitive to course context.

5.2 Correlation analysis

Table 3 presents Pearson correlations among constructs. All correlations were positive and statistically significant at the 0.01 level. BIU was strongly correlated with GAM (r = .795), and also strongly correlated with PEOU (r = .696) and PU (r = .679). Inter-correlations among predictors were moderate-to-strong (PU–GAM r = .691; PEOU–GAM r = .665; PU–PEOU r = .650). These values indicate that while constructs are related in theory-consistent directions, they are not redundant. In practical terms, the correlation pattern suggests that students who perceive stronger gamification features also tend to perceive the platform as easier to use and more useful, which is plausible because well-designed gamification often includes clearer feedback and structured progression that can reduce perceived effort.

5.3 Regression analysis and hypothesis tests

Multiple regression results are summarised in Table 4. The model was statistically significant, F(3, 67) = 50.525, p < .001, and explained 69.3% of the variance in BIU (R^2 =

.693). GAM (β = .521, p < .001) and PEOU (β = .247, p = .013) were statistically significant positive predictors of BIU. PU was not significant in the multivariate model (β = .159, p = .116). Accordingly, H2 and H3 are supported, while H1 is not supported in this dataset.

Hierarchical regression robustness check: To test whether gamification contributes incremental explanatory power beyond classic TAM predictors, a hierarchical regression was conducted. In Step 1 (TAM-only), PU and PEOU jointly predicted BIU with a substantial explained variance ($R^2 = 0.54$). In Step 2, adding GAM increased explained variance to $R^2 = 0.69$, indicating a meaningful incremental contribution. This pattern supports the interpretation that perceived gamification features are not merely a proxy for usefulness or ease-of-use, but a distinct driver of behavioural intention in this context.

Interpretation of effect pattern: The non-significant PU coefficient does not imply that usefulness is unimportant in general. Rather, it indicates that within this sample and measurement specification, the variance in BIU that PU shares with GAM and PEOU may be captured more strongly by those constructs. One plausible explanation is that in TEL ecosystems where functional utility is expected as a baseline, motivational and usability features become the differentiators that drive intention. Another explanation is measurement alignment: if students interpret PU as 'performance gain' rather than 'learning support', usefulness effects may be partially suppressed. These explanations are explored further in the discussion.

6. Discussion

The analysis indicates that perceived gamification features are the strongest predictor of students' intention to use a TEL platform when controlling usability and usefulness. This finding is consistent with the view that contemporary educational technologies operate in experience-oriented adoption contexts. When students have multiple TEL tools available and must manage attention across competing demands, motivational design signals may influence whether they return to a tool beyond minimum compliance. Recent syntheses emphasise that gamification can influence motivation and engagement, but outcomes depend on design quality and on how elements support psychological needs (Sailer & Homner, 2020; Krath et al., 2021). The present pilot results align with that broader evidence base by suggesting that learners' perceptions of gamification features are strongly associated with intention to use.

The significance of PEOU reinforces established acceptance findings: usability and low friction remain decisive in online learning. Even highly engaging mechanics will not sustain use if learners experience confusion, high cognitive load, or repeated technical barriers. This implication is particularly salient for institutions serving diverse cohorts where digital confidence varies. Recent work on educational technology acceptance in higher education similarly highlights that effort expectancy, usability, and platform clarity are often among the strongest predictors of adoption and continuance (Kemp et al., 2024; Jiang et al., 2025).

The non-significant PU effect requires careful interpretation. It may reflect a context in which students perceive most TEL platforms as 'functionally necessary' and thus view usefulness as less differentiating than engagement and usability. Another possibility is construct overlap: gamification features may influence perceived usefulness indirectly by improving the learning journey (e.g., clearer progress feedback, structured goal-setting). In such a case, the unique variance of PU in regression would be reduced, even if usefulness matters in a broader causal system. This aligns with research suggesting that continuance intention is often driven by confirmation and experience variables, with acceptance and usefulness playing indirect roles (Tseng et al., 2022). Future confirmatory work using SEM could test whether the PU effect is mediated by engagement, satisfaction, or flow.

A balanced view also requires acknowledging the risks of overgeneralising from positive associations. Systematic reviews caution that some elements can demotivate learners depending on personal preferences, social comparison sensitivity, and the learning task (Khaldi et al., 2023). In addition, effects can be time-sensitive: novelty may inflate initial engagement, while longer-term persistence depends on whether game elements remain meaningful once students learn the 'rules' of the system. Therefore, the strongest practical implication is not 'add gamification', but 'design gamification as a credible motivational layer aligned to pedagogy, and test acceptance continuously.'

Theoretically, the findings support the argument that TAM extensions for TEL should explicitly include experience-oriented predictors when technology includes motivational design. Rather than treating gamification as a peripheral feature, the model treats it as an acceptance driver that can have a distinct association with intention. This contributes to the growing acceptance literature that models hedonic and engagement-related drivers alongside classic TAM constructs in educational settings.

7. Practical Implications

For TEL designers, educators, and course coordinators, the findings suggest several practical design priorities. First, gamification should be treated as a first-class design decision with explicit learning alignment. Evidence from meta-analyses suggests that gamification is more effective when elements support competence development (clear feedback, achievable challenges) and autonomy (choice and personalised pathways), rather than when they are implemented as generic reward overlays (Sailer & Homner, 2020; Krath et al., 2021). In practice, this means mapping each game element to a specific pedagogical function (e.g., badges for mastery milestones; challenges for spaced practice; narrative for coherence and identity).

Second, usability engineering is not optional. The significance of PEOU indicates that adoption and continuance depend on low-friction interaction: clear navigation, predictable workflows, and minimal technical barriers. In many TEL deployments, gamification is implemented via plugins or external tools; if these create fragmented user journeys (multiple logins, inconsistent UI patterns), intention can decline even if the mechanics are motivating. Institutions should therefore integrate gamification with single sign-on, responsive interfaces, and accessibility requirements, and they should test usability with representative student groups before scaling.

Third, institutions should design for heterogeneity and inclusion. Not all learners respond positively to competitive or public ranking features; some students may experience anxiety or disengagement under leaderboard pressure. A practical approach is to offer optional 'game layers' and to include cooperative or self-referenced progress features (e.g., personal progress bars, private mastery badges, team quests) alongside competitive elements. This is consistent with review findings that 'deeper' elements and personalised approaches are increasingly used and may mitigate one-size-fits-all failures (Khaldi et al., 2023).

Fourth, evaluation should move beyond end-of-semester satisfaction surveys. Because novelty effects and course workload dynamics can influence intention, TEL teams should monitor behavioural analytics (logins, time-on-task, completion) and triangulate these with periodic perception checks. Where possible, A/B testing of design variants can identify which elements drive engagement for specific cohorts. Such evidence-based iteration aligns with the current shift toward data-informed educational technology practice.

Finally, professional implementation requires governance. Gamification decisions affect assessment fairness, learning culture, and student well-being. Course teams should document gamification goals, ensure alignment with assessment policies, and avoid mechanics that inadvertently privilege students with more time or prior experience. The goal is not maximum engagement at any cost, but sustainable engagement that supports learning outcomes and equity.

8. Limitations and Future Research

This study has limitations typical of a pilot survey. First, the sample size (N = 71) supports exploratory regression but limits generalisability across institutions, disciplines, and cohort profiles. Second, the sampling method was convenience-based and the total number of invitations across channels was not systematically recorded, preventing formal response-rate reporting and non-response bias assessment. Third, the study relies on self-reported perceptions and behavioural intention rather than objective usage metrics; intention is a proxy for behaviour but may not fully predict actual continued use. Fourth, the cross-sectional design cannot establish causality or rule out reverse causality (e.g., students who already enjoy TEL may rate gamification more positively).

Measurement limitations also apply. While internal consistency reliability was acceptable, the construct operationalisations may overlap conceptually (e.g., structured feedback could increase both PEOU and GAM perceptions). Furthermore, PU items focused on performance-related usefulness; future work could operationalise usefulness more explicitly in learning-outcome terms (e.g., 'helps me understand concepts').

Future research should (i) replicate the model using larger, multi-institutional samples with recorded sampling frames and response rates; (ii) validate the measurement model and competing specifications using SEM; (iii) test longitudinal dynamics to examine novelty and persistence; (iv) integrate objective behavioural metrics and learning outcomes; and (v) explore moderators such as age, digital literacy, discipline, and game element preferences. Such work would allow the field to move from pilot associations to more robust causal explanations and design guidance.

9. Conclusion

This AJBSS-format manuscript tested an extended Technology Acceptance Model in which perceived gamification features are modelled as a direct driver of behavioural intention to use TEL platforms. Using a pilot survey of higher-education students (N = 71), the analysis found that perceived gamification features and perceived ease of use significantly predict intention, while perceived usefulness is not significant when controlling those factors. The results support the view that experience-oriented design is increasingly central to TEL acceptance, particularly in contexts where functional utility is expected as a baseline. The study contributes initial evidence, transparent reporting, and a fully documented survey instrument to support replication and further confirmatory work.

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Appendix A: Survey items

Response scale: 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree.

Items below were used to compute construct composites (mean of items within each construct). Item-level means and standard deviations are included to support transparency and replication in line with typical reviewer expectations.

Table A1. Survey instrument items and item-level descriptive statistics (N = 71)

Item code	Construct	Survey item statement	Mean	Std. Dev.
PU1	Perceived Usefulness (PU)	Using the gamified TEL platform helps me accomplish learning tasks more quickly.	3.24	0.93
PU2	Perceived Usefulness (PU)	Using the gamified TEL platform improves the quality of my learning.	3.34	0.83
PU3	Perceived Usefulness (PU)	Using the gamified TEL platform is useful in my academic studies.	3.17	0.83
PU4	Perceived Usefulness (PU)	Using the gamified TEL platform enhances my ability to retain what I learn.	3.15	0.80
PU5	Perceived Usefulness (PU)	Using the gamified TEL platform increases my learning productivity.	3.24	0.81
PEOU1	Perceived Ease of Use (PEOU)	Learning to operate the gamified TEL platform is easy for me.	3.30	0.82
PEOU2	Perceived Ease of Use (PEOU)	I find the gamified TEL platform user-friendly.	3.15	0.75
PEOU3	Perceived Ease of Use (PEOU)	I can navigate the gamified TEL platform without much effort.	3.34	0.81
PEOU4	Perceived Ease of Use (PEOU)	I trust the system.	3.30	0.90
PEOU5	Perceived Ease of Use (PEOU)	Using the gamified TEL platform requires less effort compared to traditional learning methods.	3.25	0.73
GAM1	Gamification (GAM)	Points increase my motivation to learn.	3.17	0.74
GAM2	Gamification (GAM)	Leaderboards increase my motivation to learn.	3.10	0.93
GAM3	Gamification (GAM)	Badges increase my motivation to learn.	3.08	0.94
GAM4	Gamification (GAM)	Storylines or themes make lessons more interesting.	3.21	0.86
GAM5	Gamification (GAM)	Unlocking content motivates me to complete learning tasks.	3.15	0.82
GAM6	Gamification (GAM)	Timed challenges motivate me to stay engaged.	3.06	0.90
BIU1	Behavioural Intention to Use (BIU)	I enjoy participating in gamified TEL activities.	3.27	0.84
BIU2	Behavioural Intention to Use (BIU)	Gamification increases the time I spend learning.	3.08	0.87
BIU3	Behavioural Intention to Use (BIU)	Gamification makes me feel more committed to the learning activities.	3.24	0.85
BIU4	Behavioural Intention to Use (BIU)	I am more likely to return to a TEL platform when it includes gamification.	3.00	0.89