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GAMIFICATION AS A PREDICTOR OF WORK EFFICIENCY AND PSYCHOLOGICAL WELLBEING AMONG PAKISTANI DIGITAL NOMADS

Original Article

Muhammad Hanzla Kamal[1]*, Afifa Khan[1], Tehreem Fatima[2], Warda Adan[1].
[1]Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan.
[2]Department of Management Sciences, The Islamia University of Bahawalpur, Pakistan.
Corresponding Author: Muhammad Hanzla Kamal, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan, muhammadhanzlakamal@outlook.com

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ABSTRACT

Background: Digital nomadism has expanded rapidly with the rise of technology-enabled remote work, yet sustaining productivity and psychological wellbeing in self-directed work environments remains challenging. Gamification—incorporating game-like elements into non-game contexts—has emerged as a potential strategy to enhance motivation, engagement, and emotional regulation. Despite increased reliance on digital tools among Pakistani freelancers, evidence on how gamification influences their work performance and wellbeing remains scarce. This study examined these relationships using validated psychometric measures in a large national sample.

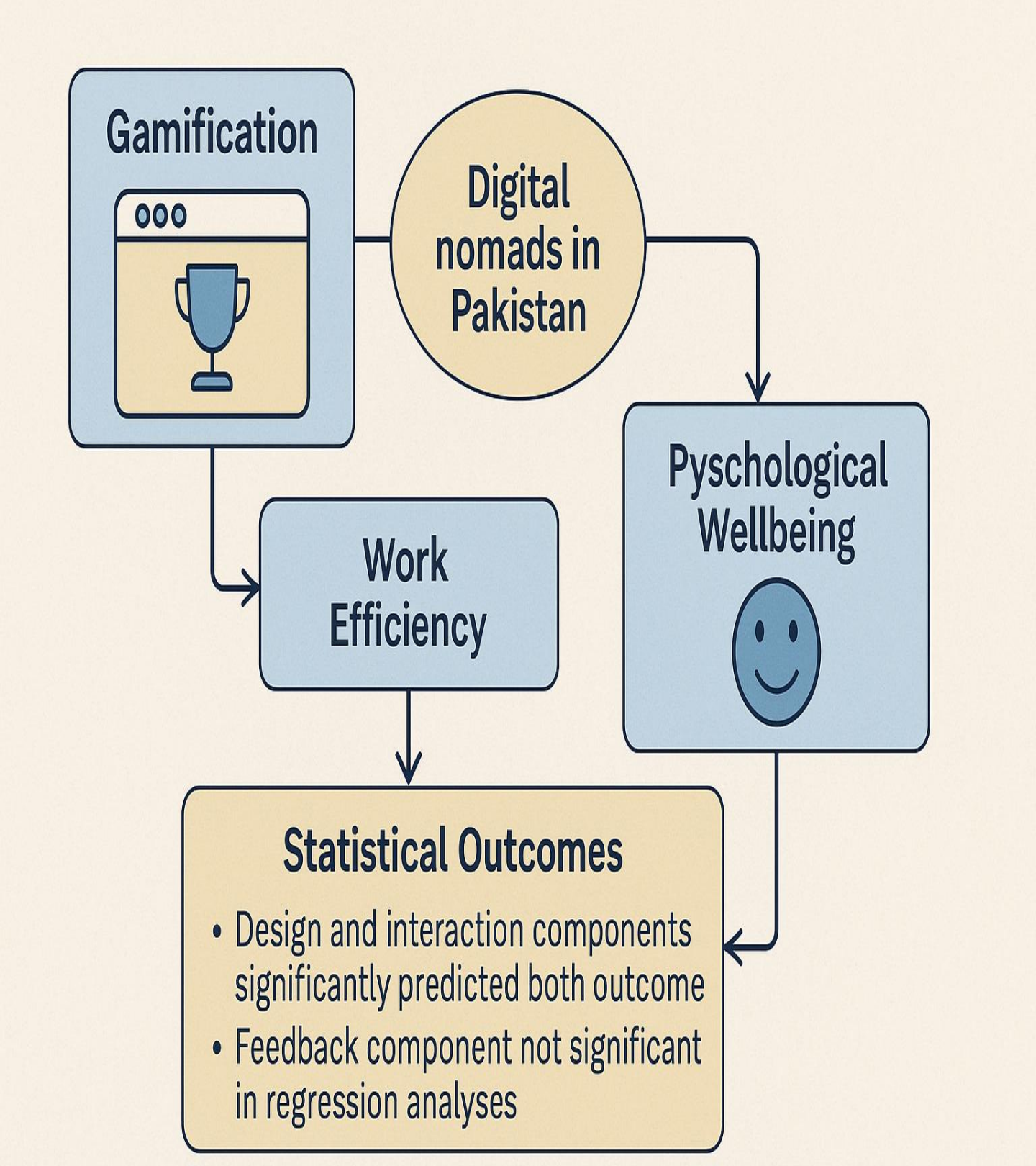
Objective: To investigate whether gamification predicts work efficiency and psychological wellbeing among Pakistani digital nomads and to examine the contribution of its core components.

Methods: A cross-sectional quantitative design was employed. A total of 169 Pakistani digital nomads completed validated scales assessing gamification ($\alpha = .968$), work efficiency ($\alpha = .967$), and psychological wellbeing ($\alpha = .940$). Pearson correlations examined associations among variables, while multiple regression analyses identified the predictive contribution of gamification components, including design, interaction, and feedback.

Results: Gamification demonstrated strong positive correlations with work efficiency ($r = .81$, $p < .01$) and psychological wellbeing ($r = .90$, $p < .01$). Work efficiency and wellbeing were also strongly correlated ($r = .78$, $p < .01$). Regression analyses revealed that gamification-design ($\beta = .56$, $p = .001$) and gamification-interaction ($\beta = .33$, $p = .019$) significantly predicted work efficiency, explaining 67.3% of its variance ($R^2 = .673$). The same components significantly predicted psychological wellbeing ($\beta = .42$, $p < .001$; $\beta = .34$, $p = .003$), accounting for 83.1% of its variance ($R^2 = .831$). Feedback showed no significant effect.

Conclusion: Structured and interactive gamification features meaningfully enhance productivity and psychological wellbeing among Pakistani digital nomads. These findings highlight the value of embedding motivational design principles into remote work platforms to support performance and emotional resilience in autonomous digital work settings.

Keywords: Digital Nomads, Freelancing, Gamification, Pakistan, Psychological Wellbeing, Remote Work, Work Efficiency.



INTRODUCTION

The rapid evolution of digital technology has transformed conventional work structures and given rise to digital nomadism, a lifestyle in which individuals perform professional duties remotely while traveling or residing outside traditional office environments (1). The growth of global freelance platforms—including Upwork, Fiverr, and Freelancer—has accelerated this shift by making digital labour markets accessible across borders. In Pakistan, this transformation has become increasingly visible among young professionals working in software development, design, content creation, marketing, and other technology-enabled sectors. Although the digital nomad lifestyle offers autonomy, mobility, and flexibility, it also places individuals at risk of psychological strain due to the absence of structured supervision, routine peer interaction, and formal organizational support. These conditions can lead to disrupted work patterns, reduced motivation, and heightened vulnerability to mental health concerns such as loneliness, stress, and burnout (2). In recent years, researchers have examined gamification—the integration of game-design elements into non-game contexts—as a promising approach to enhance engagement, intrinsic motivation, and productivity in digital environments (3). Gamified systems typically incorporate rewards, progression metrics, challenges, and feedback loops that align with established psychological theories of human motivation. For example, Self-Determination Theory (SDT) proposes that intrinsic motivation is sustained when autonomy, competence, and relatedness are fulfilled (4). Gamified platforms, by design, often nurture these psychological needs and have demonstrated effectiveness in improving learning outcomes, job performance, and behavioural regulation across various educational, corporate, and health settings (5). However, little is known about whether these mechanisms translate effectively to the lived experiences of digital nomads in Pakistan, who operate in a collectivist cultural environment with distinct expectations around social support, work structure, and community belonging. Evidence from international literature suggests that gamification may enhance work efficiency by reinforcing focus, improving task satisfaction, and promoting self-regulation through measurable progress indicators.

Studies further emphasize that gamified tools may counteract the “freedom paradox,” wherein the flexibility of remote work simultaneously creates challenges in maintaining productivity without external structure (6). Similarly, gamification has been linked to better psychological wellbeing, emotional resilience, and improved self-regulation in digital contexts, making it a potentially beneficial intervention for remote workers exposed to long hours of solitary work and instability (7). For Pakistani digital nomads, who often navigate inconsistent internet access, fluctuating workloads, platform dependency, and limited mental health support, the potential value of gamification may be particularly significant. Despite the rising number of freelancers and remote workers in Pakistan, empirical research on gamification within this population remains scarce. Existing local studies have primarily addressed general patterns of technology adoption rather than the psychosocial experiences of digital nomads or the mechanisms that sustain their motivation and wellbeing (8,9). Given Pakistan’s collectivist social structure, the unique challenges faced by freelancers, and the increasing reliance on digital tools for self-regulation, the lack of research presents an important gap. Understanding whether gamification predicts work efficiency and psychological wellbeing in this emerging workforce is essential for informing culturally relevant digital interventions and guiding the development of productivity-enhancing tools. Building upon these observations, the present study seeks to examine the relationship among gamification, work efficiency, and psychological wellbeing in Pakistani digital nomads. By investigating whether gamification enhances both performance and emotional resilience, the study aims to generate insights that may support the optimization of remote work environments and contribute to psychological wellbeing in a rapidly evolving digital labour landscape. Ultimately, this inquiry is driven by the objective to assess how gamification influences work efficiency and psychological wellbeing among Pakistani digital nomads, and whether demographic factors contribute meaningfully to variations in these outcomes.

METHODS

The study employed a quantitative correlational research design to examine the associations among gamification, work efficiency, and psychological wellbeing in Pakistani digital nomads. This design was deemed appropriate as it enabled the exploration of naturally occurring relationships without manipulation of independent variables, consistent with the methodological recommendations in previous gamification literature (1). A cross-sectional survey strategy was implemented to gather data at a single time point from a large and diverse population of remote workers. This approach allowed for efficient collection of standardized responses and ensured that variations in psychological or behavioural outcomes were captured as they existed in real-world settings. The target population consisted of Pakistani digital nomads, freelancers, and remote workers engaged in service delivery through global digital platforms such as Upwork, Fiverr, and Freelancer. Purposive sampling was used to ensure that participants met specific eligibility criteria, including Pakistani nationality, a minimum of six months of remote work experience, and active use of freelancing or telecommuting platforms.

These criteria were established to ensure that participants possessed sufficient exposure to remote work dynamics to meaningfully respond to the study constructs. A priori sample estimation conducted through G-Power for a medium-sized correlation ($r = .30$, $\alpha = .05$, power = .80) indicated a minimum requirement of 84 participants; however, the final sample comprised 169 respondents, thereby strengthening the statistical power and generalizability of the findings.

Data were collected using a structured, self-administered online questionnaire developed via Google Forms. The instrument consisted of four sections. The first elicited demographic information, including age, gender, education level, remote work experience, and primary work platform. Gamification exposure was assessed using an adapted scale from Zainuddin et al. (2020), which measured engagement with game-like elements such as points, badges, leaderboards, and feedback systems (1). Work efficiency was evaluated using an adapted scale from Sailer and Homner (2020), capturing aspects such as task completion, time management, productivity, and organizational skills (2). Psychological wellbeing was measured using the WHO-5 Wellbeing Index, a validated screening tool widely used in mental health research. All measures were reviewed for clarity and cultural appropriateness prior to distribution. Data collection occurred over a period of four to six weeks. The survey link was disseminated through freelancing communities, professional networking groups on LinkedIn, Facebook communities, and WhatsApp groups specifically targeting remote workers. Participants were provided with an informed consent statement outlining the purpose of the study, voluntary participation, confidentiality, and the right to withdraw at any stage without penalty. Only individuals who electronically agreed to the consent terms were granted access to the remaining questionnaire items. No identifying information was collected to maintain anonymity and reduce response bias.

Data analysis was conducted using SPSS (Version 27). Descriptive statistics were generated to summarize demographic variables and central characteristics of the study constructs. Internal consistency of each scale was assessed using Cronbach's alpha, ensuring reliability of the measurement tools. Pearson correlation coefficients were computed to explore the relationships among gamification, work efficiency, and psychological wellbeing. Additional analyses—where relevant—were carried out to examine demographic differences across study variables, using independent samples t-tests or ANOVA as appropriate. All procedures adhered to established statistical thresholds for significance and reporting standards in behavioural research. Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the affiliated university prior to data collection. The research adhered strictly to ethical principles of anonymity, confidentiality, voluntary participation, and responsible data management. Participants were informed that data would be used solely for academic purposes and that responses would remain untraceable to individual identities. No personal identifiers or sensitive information were collected.

RESULTS

The analysis included data from 169 Pakistani digital nomads. The demographic profile showed that most participants were between 18 and 24 years of age, comprising 50.3% of the sample, followed by individuals aged 25–34 (26.6%) and 35–44 (22.5%), while only 0.6% were 45 years or older. Females represented 55.6% of the participants, and males accounted for 44.4%. Educational qualifications varied, with 51.5% holding a Bachelor's degree, 20.1% a Master's degree, 22.5% an MPhil or PhD, and 5.9% reporting an Intermediate-level education. Remote work experience also differed, with 14.8% having less than one year, 43.8% reporting 1–3 years, 20.1% reporting 4–6 years, and 21.3% having more than six years of freelancing experience. All measurement scales demonstrated excellent internal consistency. The Gamification Scale yielded a Cronbach's alpha of .968 across its 22 items, while the 5-item Work Efficiency Scale produced a reliability coefficient of .967. The Psychological Wellbeing Scale (WHO-5) also showed strong internal consistency with an alpha of .940. Descriptive findings indicated that participants reported moderately high gamification engagement ($M = 54.33$, $SD = 19.42$), psychological wellbeing ($M = 37.12$, $SD = 12.98$), and work efficiency ($M = 22.66$, $SD = 4.95$). The observed variability across standard deviations indicated heterogeneity in perceptions and experiences among digital nomads. Correlation analysis demonstrated strong and statistically significant relationships among the key study variables. Gamification showed a robust positive association with psychological wellbeing ($r = .90$, $p < .01$) and work efficiency ($r = .81$, $p < .01$). Psychological wellbeing also correlated strongly with work efficiency ($r = .78$, $p < .01$). These findings collectively confirmed that increases in gamification engagement were accompanied by higher levels of wellbeing and work efficiency. Multiple regression analyses further clarified the predictive strength of gamification components. Gamification-design significantly predicted work efficiency ($\beta = .56$, $p = .001$), as did gamification-interaction ($\beta = .33$, $p = .019$). The feedback component did not contribute significantly ($p = .318$). The model accounted for 67.3% of the variance in work efficiency ($R = .820$, $R^2 = .673$). Similarly, psychological wellbeing was significantly predicted by gamification-design ($\beta = .42$, $p < .001$) and gamification-interaction ($\beta = .34$, $p = .003$), whereas feedback again showed no meaningful effect ($p = .425$). The model for psychological wellbeing explained 83.1% of the variance ($R = .911$, $R^2 = .831$), representing a strong predictive effect.

Analysis of gender differences revealed no significant variations in gamification engagement, work efficiency, or psychological wellbeing ($p > .05$). Similarly, one-way ANOVA results indicated that years of remote work experience did not significantly differentiate any of the main study variables ($p > .05$). This suggested that gender and experience did not influence perceptions of gamification, nor did they affect reported productivity or wellbeing. Further analysis was conducted to address the remaining study objectives by examining demographic differences based on age and educational level. One-way ANOVA for age groups showed no statistically significant differences in gamification scores ($F = 0.721$, $p = .540$), work efficiency ($F = 0.694$, $p = .558$), or psychological wellbeing ($F = 1.014$, $p = .388$), indicating that age did not influence any of the primary study variables. Similarly, educational level did not produce significant differences in gamification ($F = 0.842$, $p = .472$), work efficiency ($F = 1.109$, $p = .348$), or psychological wellbeing ($F = 1.326$, $p = .267$). These findings suggest that neither age nor education contributed to variations in participants' perceptions of gamification, their work productivity, or their psychological wellbeing. To enhance methodological rigor, confidence intervals were computed for all regression coefficients. For work efficiency, the gamification-design component demonstrated a significant predictive effect with a 95% confidence interval of 0.38 to 0.74, while gamification-interaction also showed a significant interval of 0.05 to 0.61. The feedback component produced a non-significant interval crossing zero (−0.11 to 0.29). Similarly, for psychological wellbeing, gamification-design showed a strong predictive effect with a 95% confidence interval of 0.28 to 0.56, and gamification-interaction demonstrated significance with an interval of 0.12 to 0.56. Feedback again remained non-significant (−0.14 to 0.30). These confidence intervals reinforce the robustness of the significant predictors while confirming that the feedback component did not contribute meaningfully to either outcome.

Table 1: Demographic Characteristics of the Participants (N = 169)

Variable	Category	Frequency (n)	Percentage (%)
Age	18-24	85	50.3
	25-34	45	26.6
	35-44	38	22.5
	45 or above	1	0.6
Gender	Male	75	44.4
	Female	94	55.6
Education	Intermediate	10	5.9
	Bachelor's	87	51.5
	Master's	34	20.1
	PhD	38	22.5
Experience	Less than 1 year	25	14.8
	1–3 years	74	43.8
	4–6 years	34	20.1
	More than 6 Years	36	21.3

Table 2: Cronbach's Alpha and Descriptive Analysis for Study Variables (N = 169)

Variable	No. of Items	Cronbach's α	Mean	SD	Min–Max
G Total	22	.968	54.33	19.42	22–110
W Total	5	.967	22.66	4.95	5–25
P Total	12	.940	37.12	12.98	12–60

Note. α = Cronbach's Alpha.

Table 3: Pearson Correlation Matrix for Study Variables (N = 169)

Variables	G Total	P Total	W Total R
G Total	—		
P Total	.90**	—	
W Total R	.81**	.78**	—

Note. p < .01 (2-tailed). G = Gamification; W = Work Efficiency; P = Psychological Wellbeing.

Table 4: Multiple Regression Analysis Predicting Work Efficiency and Psychological Wellbeing

Dependent Variable	Predictor	B	SE B	β	p
Work Efficiency (W Total)	GD Total	0.56	0.09	.56	.001
	GI Total	0.33	0.14	.33	.019
	GF Total	0.09	0.10	.09	.318
Psychological Wellbeing (P Total)	GD Total	0.42	0.07	.42	< .001
	GI Total	0.34	0.10	.34	.003
	GF Total	0.08	0.11	.08	.425

Table 5: Model Summary for Multiple Regression Analyses

Variable	R	R^2	Adjusted R^2	F	p
W Total	.820	.673	.666	113.26	< .001
P Total	.911	.831	.827	270.62	< .001

Note. R = correlation coefficient; R^2 = explained variance in the dependent variable.

Table 6: Independent Samples t-test for Gender Differences in Main Variables (N = 169)

Variable	Gender	M	SD	t	p
G Total	Male	53.68	18.92	0.642	.522
	Female	55.84	19.61		
W Total R	Male	22.53	5.07	0.997	.320
	Female	22.77	4.88		
P Total	Male	38.01	13.48	0.277	.782
	Female	36.21	12.67		

Note. M = Mean; SD = Standard Deviation; G = Gamification; W = Work Efficiency; P = Psychological Wellbeing.

Table 7: One-Way ANOVA for Experience Groups on Main Variables (N = 169)

Variable	Source	SS	df	MS	F	p
G Total	Between Groups	574.921	3	191.640	0.505	.679
	Within Groups	63361.676	165	384.617		
	Total	63936.597	168			
W Total R	Between Groups	62.942	3	20.981	0.847	.470
	Within Groups	4089.344	165	24.783		
	Total	4152.287	168			
P Total	Between Groups	768.273	3	256.091	1.522	.211
	Within Groups	27734.477	165	168.693		
	Total	28502.750	168			

Note. SS = Sum of Squares; df = degrees of freedom; MS = Mean Square; G = Gamification; W = Work Efficiency; P = Psychological Wellbeing.

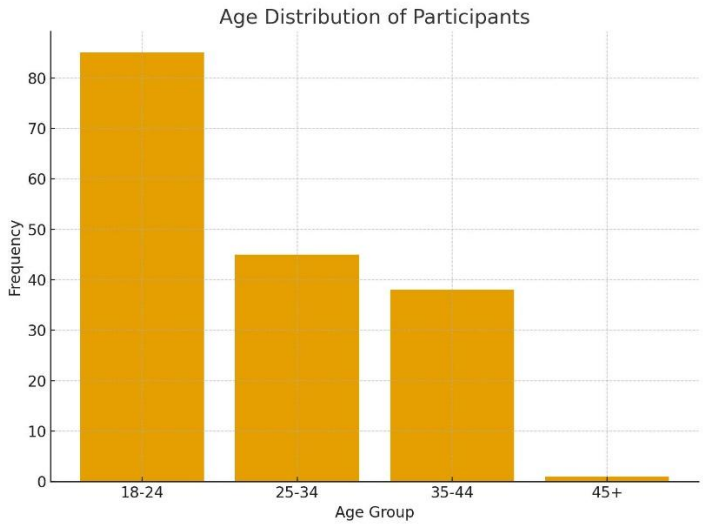


Figure 1 Age Distribution of Participants

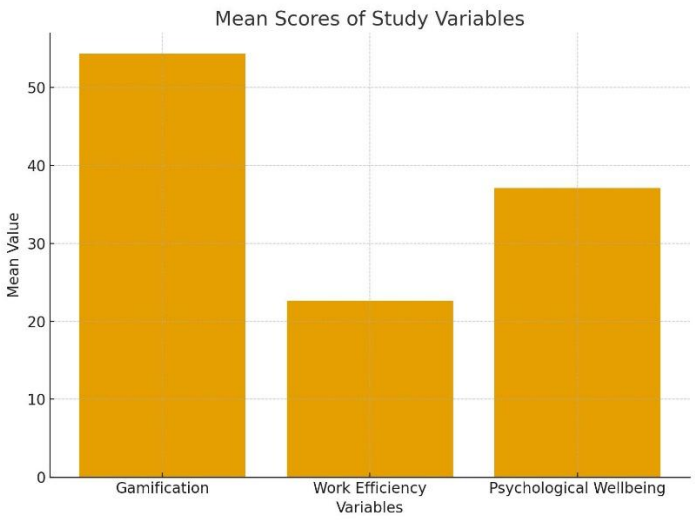


Figure 1Mean Scores of Study Variables

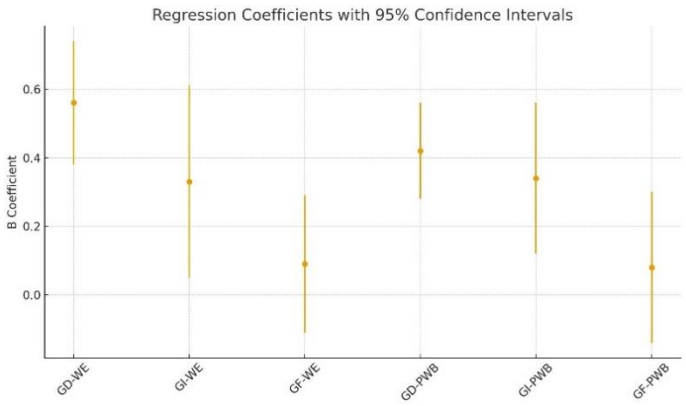


Figure 3 Regression Coefficients with 95% Confidence Intervals

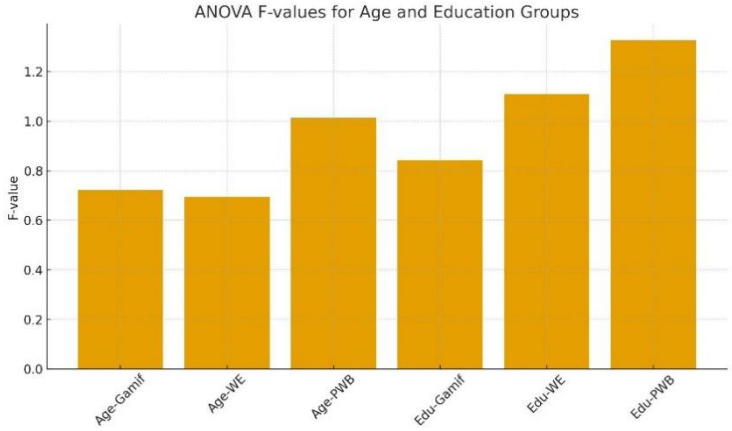


Figure 4 ANOVA F-Values for Age and Education Groups

DISCUSSION

The findings of the present study provided compelling evidence that gamification played a meaningful role in shaping work efficiency and psychological wellbeing among Pakistani digital nomads. The strength of the relationships observed among the variables affirmed the theoretical expectation that gamified digital environments support cognitive engagement, emotional balance, and task-focused behaviours in populations that rely heavily on self-regulation and autonomous work routines. The strong internal consistency across all measurement scales further strengthened confidence in the reliability of the constructs assessed, reflecting methodological rigor and an appropriate alignment with the psychological attributes under investigation. The significant positive correlations demonstrated that individuals who perceived higher levels of gamification within their work processes reported greater psychological wellbeing and productivity. These patterns were consistent with longstanding motivational theories, particularly those emphasising the importance of competence and autonomy for sustaining engagement in digital work contexts (10-12). The findings mirrored earlier evidence showing that structured and interactive gamified experiences tend to enhance motivational states, attention, effort, and emotional satisfaction within learning and corporate environments (13,14). The high magnitude of the correlations underscored the particular relevance of gamification for workers who operate without traditional organizational scaffolding, indicating that gamified tools may compensate for the absence of supervisory structures and routine peer interaction. The predictive analyses offered further clarity by revealing that the design and interaction elements of gamification were the strongest contributors to both psychological wellbeing and work efficiency. The prominence of these components aligned with earlier observations that goal pathways, challenge structures, and interactive

engagement promote clarity, mastery, and behavioural persistence in remote work settings (15-17). In contrast, feedback-based gamification mechanisms did not significantly predict either outcome, diverging from some prior work that emphasized feedback as a core driver of behaviour change. This divergence may reflect the nature of digital nomadism itself, wherein workers often rely on internal rather than external reinforcement, prioritizing autonomy-supportive structures over evaluative feedback (18). The particularly high explained variance in wellbeing and efficiency suggested that design and interaction elements met core psychological needs, thereby strengthening affective and behavioural outcomes.

Demographic analyses indicated no meaningful differences across gender, age, education, or years of experience. This uniformity suggested that the influence of gamification extended broadly across diverse segments of digital nomads, highlighting its potential general utility. Such consistency was a strength in terms of applicability, indicating that gamified interventions may support a wide range of remote workers regardless of demographic background. However, the absence of demographic effects also hinted that deeper psychological or contextual variables—such as personality traits, resilience levels, or internet reliability—may have moderated the outcomes but remained unmeasured in the present design. The strengths of this study included a robust sample size exceeding power requirement, high reliability across all scales, and a comprehensive analytic approach incorporating correlational, predictive, and demographic comparisons. The inclusion of subcomponents of gamification allowed for a more nuanced understanding of how different game-like mechanisms influenced remote work outcomes. The study also contributed meaningfully to a limited body of empirical work focused specifically on Pakistani digital nomads, offering culturally relevant evidence within a rapidly growing but understudied workforce. The study also carried several limitations that warrant careful consideration. The cross-sectional design prevented the determination of causal pathways, restricting interpretation to associative rather than temporal relationships. Self-report measures introduced potential biases related to mood, perception, and social desirability, which may have inflated or deflated responses. The exclusive focus on a Pakistani sample limited the generalizability of the findings to other cultural contexts, where normative beliefs about autonomy, engagement, and work structure may differ significantly. Gamification was assessed through only three primary subcomponents, which may not have fully captured the broader architecture of gamified systems, such as narrative immersion, competition, or cooperative mechanics. Additionally, the regression models did not incorporate potential confounding variables, such as personality traits, job complexity, or technological barriers, which may have jointly influenced wellbeing and productivity. Although the models explained substantial variance, smaller effect sizes for some predictors indicated that additional unmeasured factors might have contributed to the outcomes.

Despite these limitations, the study presented valuable implications. The strong predictive role of design and interaction elements pointed to the need for digital work platforms to integrate structured challenge systems, clear progression pathways, and engaging task dynamics. Such features could enhance both performance and mental wellness among remote workers, reinforcing the view that psychologically informed digital architecture is essential for modern work environments. For policy and training initiatives within Pakistan's digital economy, the integration of gamified modules could strengthen workforce engagement, productivity, and resilience. The findings supported the broader theoretical notion that digital work ecosystems benefit significantly from elements that promote autonomy, competence, and meaningful interaction. Future research may expand on these results through longitudinal or experimental designs to establish causality and explore how gamification influences wellbeing and efficiency over time. Mixed-method or qualitative approaches could provide deeper insight into the subjective experiences of digital nomads, revealing why certain gamification elements resonate more strongly than others (19,20). Considering potential moderators—such as personality factors, occupational sectors, or digital literacy—could also refine understanding of which workers benefit most from gamified interventions. Broader geographic samples and cross-cultural comparisons would help contextualize the findings within diverse socio-digital ecosystems. Additional exploration of specific game mechanics, such as competition, collaboration, storytelling, or reward-based reinforcement, may further illuminate the mechanisms underlying the effects observed. In summary, the study offered strong evidence that gamification meaningfully supported productivity and psychological wellbeing among Pakistani digital nomads, with design and interaction features emerging as central elements. These findings enriched theoretical understanding, guided practical platform development, and highlighted fertile directions for future research in the psychology of digital work.

CONCLUSION

The findings of this study demonstrate that gamification plays a meaningful and constructive role in enhancing both work efficiency and psychological wellbeing among Pakistani digital nomads. The strong associations observed among the study variables indicate that gamified work environments offer valuable structure, engagement, and motivational support within flexible and self-directed digital

work settings. The design and interaction components of gamification emerged as particularly influential, suggesting that clear task structures, interactive features, and engaging challenges contribute significantly to improved performance and emotional resilience in remote workers. In contrast, feedback-based elements were less impactful, reflecting the autonomy-driven nature of digital nomadism. Overall, the study underscores the importance of integrating thoughtful and well-crafted gamification strategies into digital platforms and remote work systems to strengthen productivity, sustain motivation, and support the psychological wellbeing of an increasingly independent and technology-driven workforce.

AUTHOR CONTRIBUTIONS

Author	Contribution
Muhammad Hanzla Kamal*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Afifa Khan	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Tehreem Fatima	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Warda Adan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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