

THE IMPACT OF GENERATIVE AI CO-PILOT INTEGRATION AND TASK-TECHNOLOGY FIT ON INDIVIDUAL CREATIVE PRODUCTIVITY

Muhammad Tariq Siddiqui^{*1}, Ambreen Ashfaq², Muhammad Kamran Ashfaq³, Sarim Zafar⁴,
Fatima Zafar Farooqui⁵, Ariba Khan⁶

^{*1,3}Hamdard University

^{2,5,6}Baqai Institute of Health Management Sciences, Baqai Medical University

⁴Department of Public Health Baqai Medical University

¹tariq.zayab@gmail.com

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Corresponding Author: *

Muhammad Tariq Siddiqui

Abstract

The proliferation of generative artificial intelligence tools across professional domains has prompted organizations to invest substantially in these technologies, yet the conditions under which they genuinely enhance individual creative productivity remain inadequately understood. Drawing upon task-technology fit theory, this study examined the interactive effects of generative AI co-pilot integration and task-technology fit on creative productivity among knowledge workers. A quantitative cross-sectional survey was conducted with 200 knowledge workers employed across technology, marketing, design, and consulting firms in Karachi, all of whom utilized generative AI tools such as Microsoft 365 Copilot, ChatGPT, Gemini, and Bard as part of their daily professional routines. Data were analyzed using multiple linear regression to assess the individual and combined predictive effects of the independent variables on creative productivity. The findings revealed that AI integration level emerged as a significant positive predictor of creative productivity ($\beta = 0.344, p < .001$), indicating that deeper assimilation of AI tools into daily workflows substantially enhances creative output. Task-technology fit, however, demonstrated a non-significant relationship ($\beta = 0.179, p = .057$), though the p-value approached conventional significance thresholds. These results suggest that within the context of creative knowledge work, the depth and frequency of AI tool integration may exert a more immediate influence on productivity than the perceived alignment between tool capabilities and task requirements. This study contributes to the growing body of literature on generative AI adoption by highlighting the primacy of integration processes over fit perceptions in predicting creative productivity outcomes. The findings offer practical implications for organizations seeking to maximize returns on generative AI investments through strategies that encourage consistent, deep integration of these tools into routine creative workflows, while acknowledging that fit considerations remain relevant and warrant continued attention in future research.

INTRODUCTION

The rapid proliferation of generative artificial intelligence (AI) tools across professional landscapes marks a potential paradigm shift in how knowledge work is conducted. From software development with GitHub Copilot to content creation with Microsoft 365 Copilot and specialized design platforms, these technologies promise unprecedented enhancements to individual productivity, particularly in creative domains (Al-Dokhny et al., 2024). Organizations are investing heavily in these tools, operating under the implicit assumption that access alone will translate into tangible performance gains. However, the empirical reality is more nuanced; the mere presence of a sophisticated AI tool does not guarantee its effective use or a subsequent boost in output (Bhat et al., 2026). This discrepancy between the promise of generative AI and its actual impact on individual creative productivity forms the central problem that this study seeks to address. A critical gap exists in understanding the specific conditions under which these powerful technologies become genuine productivity levers rather than sources of distraction or inefficiency.

A growing body of literature has begun to explore the determinants of generative AI adoption and its subsequent effects. The Task-Technology Fit (TTF) theory has emerged as a particularly robust framework for this inquiry, positing that technology will only be utilized and lead to performance improvements when its capabilities are well-aligned with the requirements of the task at hand (Al-Dokhny et al., 2024). Recent studies have validated the relevance of TTF in various generative AI contexts, demonstrating its influence on adoption intentions and performance in sectors ranging from healthcare to education (Fianu, Amankwah-Sarfo, & Ofori, 2024; Bhat et al., 2026). For instance, Alianzas et al. (2025) found that a strong TTF significantly moderated the relationship between organizational support and faculty performance in higher education, suggesting that the fit between the AI's functions and academic tasks is a critical mediator of success. Similarly, in the realm of teaching innovation, Chen et al. (2025)

highlighted that TTF is a more powerful predictor of teachers' intentions to use AI for innovative pedagogy than mere technological attraction, underscoring that alignment, not just novelty, drives meaningful engagement. Concurrently, research on user acceptance, such as the work by Kumar and Pathak (2026) on algorithmic HRM, points to a multi-level assimilation process where the depth of integration into work routines is a key factor influencing ultimate outcomes.

While these studies provide foundational insights, they often examine TTF and integration levels as separate, additive predictors of performance. What remains underexplored is the critical interaction between the level of AI integration into one's workflow, characterized by frequency of use and depth of feature adoption, and the perceived TTF. It is plausible that a high level of integration without a corresponding TTF could be counterproductive. A user who is deeply integrated with a generative AI tool that is a poor match for their creative tasks might experience increased cognitive load, workflow disruptions, and ultimately, diminished creative output (Kumar & Fianu, 2026; Herzog, 2024).

Conversely, even a perfect TTF might not yield full productivity benefits if the tool is used only superficially or sporadically. This suggests that the true impact on creative productivity may be contingent on the synergistic, or antagonistic, interplay between these two factors. The rationale for the current study, therefore, stems from the need to move beyond examining the individual effects of either AI integration or TTF and to instead model their combined influence.

The primary purpose of this study is to investigate the interactive effect of generative AI co-pilot integration and task-technology fit on the creative productivity of knowledge workers. By surveying professionals in technology, marketing, design, and consulting who routinely utilize generative AI tools, this research aims to empirically test the hypothesis that the performance benefits of these technologies are not uniform but are instead a function of the interaction between how deeply the tool is woven

into daily work and how well its capabilities align with the specific creative tasks being performed. The objective is to provide a more granular and actionable understanding for organizations seeking to maximize their return on investment in generative AI. By moving beyond a simple adoption-focused narrative and employing a TTF lens, this study aspires to offer evidence-based guidance on fostering conditions, specifically, achieving a synergistic balance of integration and fit, that genuinely enhance individual creative productivity in the age of generative AI.

Methodology

The methodology for this study employed a quantitative, cross-sectional survey design to examine the interactive effects of generative AI co-pilot integration and task-technology fit on individual creative productivity. Data were gathered from a purposive sample of 200 knowledge workers employed across technology, marketing, design, and consulting firms, all of whom utilized generative AI tools such as Microsoft 365 Copilot, GitHub Copilot, ChatGPT, or Midjourney as an integral component of their daily professional routines. The sampling strategy targeted individuals who possessed at least three months of experience with their respective AI tools, ensuring that respondents had sufficient exposure to provide meaningful assessments of integration levels and task-technology fit.

Data collection was conducted through a structured online survey administered via a professional platform. The survey instrument comprised three primary sections corresponding to the study's core variables. For the first

independent variable, level of generative AI co-pilot integration, respondents reported their frequency of tool usage on a five-point Likert scale ranging from rarely to multiple times daily, alongside a checklist of ten common features from which a composite adoption score was derived. The second independent variable, task-technology fit, was measured using a validated seven-item scale adapted from established TTF instruments, with responses captured on a seven-point Likert scale ranging from strongly disagree to strongly agree. The dependent variable, individual creative productivity, was operationalized as a composite measure combining three self-reported indicators: the percentage of time saved on creative tasks compared to baseline, a five-point self-rating of improvement in output quality, and the number of completed creative deliverables per week relative to the period prior to AI adoption.

Prior to full deployment, the survey instrument was pilot tested with a small subset of the target population to refine question clarity and establish reliability. Data analysis was conducted using statistical software. Descriptive statistics were first computed to summarize the sample characteristics. Subsequently, multiple linear regression analysis was employed to test the hypothesized relationships, with particular focus on the interaction term between AI integration and task-technology fit. Hierarchical regression modeling allowed for the isolation of individual and combined effects, enabling a robust examination of whether the interaction between these two independent variables significantly predicted variance in creative productivity beyond their main effects alone.



Results

Table 1 Respondent Profile

Demographic Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	118	59.0
	Female	82	41.0
	Prefer not to say	0	0.0
Age Group	18-25 years	24	12.0
	26-35 years	86	43.0
	36-45 years	62	31.0
	46 years and above	28	14.0
Industry Sector	Technology / IT	72	36.0
	Marketing / Advertising	48	24.0
	Design / Creative Services	44	22.0
	Consulting	36	18.0
Primary Generative AI Tool Used	Microsoft 365 Copilot	52	26.0
	ChatGPT	68	34.0
	GitHub Copilot	38	19.0
	Midjourney / Other Design AI	42	21.0
Experience with Generative AI	Less than 6 months	18	9.0
	6-12 months	52	26.0
	1-2 years	74	37.0
	More than 2 years	56	28.0

Frequency of AI Tool Usage	Rarely (few times per month)	12	6.0
	Occasionally (few times per week)	38	19.0
	Frequently (once daily)	54	27.0
	Very frequently (multiple times daily)	96	48.0
Educational Background	Bachelor's Degree	104	52.0
	Master's Degree	82	41.0
	Doctorate / Professional Degree	14	7.0

The respondent profile reveals a predominantly male sample (59%) within the 26–35-year age bracket (43%). Most participants work in technology (36%) and primarily use ChatGPT (34%). The majority possess 1–2 years of AI

experience (37%) and utilize these tools multiple times daily (48%), indicating a technically proficient and highly engaged sample from Karachi.

Table 2 Regression Coefficients for Predictors of Creative Productivity

Model	Variable	Unstandardized	Standardized	t	p
		Coefficients	Coefficients		
		B	SE	Beta	
1	(Constant)	1.624	0.272	5.977	< .001
	AI Integration Level	0.361	0.098	0.344	3.682 < .001
	Task-Technology Fit	0.199	0.104	0.179	1.917 .057

The regression analysis presented in Table 2 examines the predictive effects of AI integration level and task-technology fit on creative productivity. The model reveals that AI integration level is a significant positive predictor of creative productivity ($B = 0.361$, $\beta = 0.344$, $p < .001$), indicating that higher levels of AI tool

integration correspond to greater creative output. Task-technology fit, however, demonstrates a non-significant relationship ($B = 0.199$, $\beta = 0.179$, $p = .057$), though the p-value approaches conventional significance thresholds. The constant term is also significant ($B = 1.624$, $p < .001$). These findings suggest that within this

sample, the depth of AI integration into daily workflows exerts a stronger independent influence on creative productivity than the perceived alignment between AI capabilities and task requirements.

Discussion

The findings of this study reveal that AI integration level emerged as a significant predictor of creative productivity, while task-technology fit demonstrated a non-significant relationship, albeit approaching conventional significance thresholds. This result partially diverges from the foundational tenets of task-technology fit theory, which posits that alignment between technology capabilities and task requirements is essential for performance gains (Al-Dokhny et al., 2024; Bhat et al., 2026). The strong predictive power of AI integration suggests that within the context of generative AI tools, the depth of assimilation into daily workflows may temporarily overshadow the importance of perceived fit. This aligns with the multi-level assimilation model proposed by Kumar and Pathak (2026), which emphasizes that integration processes play a critical role in determining technology outcomes.

However, the near-significant finding for task-technology fit warrants careful consideration. The borderline p-value of .057 suggests that fit may exert an influence that becomes more pronounced under specific conditions. Recent research has highlighted that task-technology fit can have complex, sometimes contradictory effects. Qian and Xie (2026) demonstrated that TTF in generative AI contexts can lead to both enhanced performance and increased conflict, suggesting a double-edged-sword effect. Similarly, Shukla, Mishra, and Dwivedi (2026) argued that the hype surrounding generative AI often obscures the nuanced role of fit in determining genuine productivity outcomes. The non-significance in the current study may also reflect measurement considerations, as self-reported TTF perceptions may vary based on task complexity and user expertise (Chen et al., 2025; Fianu, Amankwah-Sarfo, & Ofori, 2024).

The dominance of AI integration in predicting creative productivity may further be explained by the nature of creative tasks themselves. Creative work often involves iterative experimentation and exploration, processes that may benefit more from frequent, deep engagement with AI tools than from a perfect initial fit between tool capabilities and task requirements (Nalini, Amrutha, & Anandavel, 2024; Zhang, Xiang, & Zach, 2025). Herzog (2024) noted that in consulting contexts, sustained use and integration often precede the refinement of fit perceptions. Moreover, the organizational and educational contexts within which generative AI is deployed may moderate these relationships, as suggested by Aliazas et al. (2025) and Kumah and Fianu (2026), who found that support systems and contextual factors significantly influence how TTF translates into performance. The present findings therefore contribute to an emerging understanding that while task-technology fit remains conceptually important, its practical effects may be contingent upon integration depth and other contextual moderators (Rahmi, Santoso, & Azrul, 2026; Wang, Zhu, & Zhu, 2025; Zhu, Gan, & Wang, 2026).

Conclusion

This study set out to examine the interactive effects of generative AI co-pilot integration and task-technology fit on individual creative productivity among knowledge workers in Karachi. The findings reveal that AI integration level significantly predicts creative productivity, whereas task-technology fit did not reach conventional statistical significance. These results suggest that within the context of creative knowledge work, the depth and frequency of AI tool assimilation into daily workflows may exert a more immediate influence on productivity than the perceived alignment between tool capabilities and task requirements. Organizations seeking to maximize returns on generative AI investments should therefore prioritize strategies that encourage consistent, deep integration of these tools into routine practices. However, the near-significant finding for task-technology fit indicates that alignment considerations should



not be entirely overlooked. Future research should explore longitudinal designs and potential moderating variables to further elucidate the conditions under which fit becomes a critical determinant of creative productivity outcomes.

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