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The Rise of the Digital Mentor: Exploratory Analysis of Student Perceptions of Generative AI in Hospitality Education

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Abstract

The rise of the Digital Mentor has been facilitated due to the advancement of technology. Traditional mentorship was constrained by geography, space and time while imparting domain expertise. Currently Generative AI tools (Gen AI) have become ubiquitous in higher education. They have evolved to be Digital Mentors. This study investigates the impact of Gen AI on cognitive scaffolding, student independence, and psychosocial support with reference to hotel management students. A pilot study was conducted among students (N=44) at St. Joseph's Institute of Hotel Management & Catering Technology, Palai. A multi-dimensional survey instrument was developed covering six key constructs: Cognitive Scaffolding (CS), Psychological Support (PS), Critical Thinking (CT), Trust and Reliability (TS), Independent Learning (IS), and Adoption/Usability (AS). Pearson's correlation analysis was used to understand the strength of relationship between the constructs and Independent Samples t-test was used to test whether the primary device affects the perceived psychological support (PS). Preliminary analysis revealed high internal consistency for the Cognitive Scaffolding (CS) ($\alpha = 0.84$) and Independent Learning (IS) ($\alpha = 0.81$) constructs, suggesting these are the most robust dimensions of the AI mentoring experience. Critical Thinking (CT) ($\alpha = 0.74$) and Adoption (AS) ($\alpha = 0.70$) also met acceptable reliability thresholds. However, Psychosocial Support (PS) ($\alpha = 0.69$) and Trust (TS) ($\alpha = 0.62$) demonstrated more modest reliability, likely due to the exploratory nature of the pilot sample and the complexity of these emotional dimensions. Initial findings suggest that AI tools significantly enhance student's perceived ability to manage complex tasks and foster a sense of learning autonomy. While students rely heavily on AI for cognitive support, trust in academic accuracy remains a more nuanced factor.

Keywords: Generative AI, Digital Mentorship, Hospitality Education, Cognitive Scaffolding, Student Autonomy, JASP.

Introduction

Within contemporary higher education, generative AI can function as an intellectual partner, provided a "human-in-the-loop" strategy is maintained to safeguard critical oversight (Mollick & Mollick, 2023). This paper examines the "Digital Mentor", a framework

in which AI serves as a *More Knowledgeable Other (MKO)* capable of delivering real-time, adaptive guidance. The paper is grounded on the theory of Zone of Proximal Development (ZPD) (Vygotsky, 1978) and the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003).

Objectives of the Study

- To quantify the correlation between student ***AI Adoption (AS)*** and their perception of ***Cognitive Scaffolding (CS).***
- To analyse the relationship between ***Cognitive Scaffolding (CS)*** and the subsequent development of ***Student Independence (IS)***.
- To investigate the influence of ***Critical Thinking (CT)*** on the degree of ***Trust (TS)*** students place in AI's academic reliability.
- To determine if a statistically significant difference exists in perceived ***Psychological Support (PS)*** based on the student's primary hardware interface.

Significance of the Study

This study offers a practical framework for integrating AI-driven mentorship in hospitality education, a domain traditionally defined by high-touch, human-centric contact. By examining how hotel management undergraduates adopt, perceive, and critically engage with modern generative AI tools, this research provides empirical insights into how digital scaffolding can foster learner autonomy without compromising intellectual rigor.

Literature Review

The Evolution of Educational Mentorship

Early studies observed that advancement in digital tools made it more capable and evolving it to a digital mentor(Lajoie & Derry, 1993). Educational mentorship has transformed from direct face to face interaction to computer mediated communication (CMC) over the years and thus breaking the constraints of geography, time and social hierarchies. Today this has evolved into Generative AI. (Bierema & Merriam, 2002). Ensher et al. (2003) noted in their study that virtual environment increases the occurrence of miscommunication and hence negatively affects trust. According to Wollny et al.(2021) early educational chatbots and pedagogical agents were of limited capability offering basic self-regulated learning support and lacked scaffolding capabilities. Latest studies has explored how higher order thinking skills (HOTS) is enhanced via collaborative learning while using Chat GPT 4 via Discord, these studies indicate that Gen AI is an active partner in " Hybrid Intelligence" (L. Fan et al., 2025; Järvelä, Nguyen, Vuorenmaa, et al., 2023; Mollick & Mollick, 2023) Within frameworks such as the Human-AI Shared Regulation in Learning (HASRL) model, multimodal agents actively identify learning obstacles and prompt metacognitive, socially shared regulation to support students' cognitive and emotional states(Edwards et al., 2025; Järvelä, Nguyen, & Hadwin, 2023)

Challenges in the New Mentoring Landscape

Mollick & Mollick (2023) has identified the tendency of AI to confabulate or hallucinate information as a major challenge. Another challenge is that the expectation of user towards the competency of AI mentor might induce cognitive dissonance as observed by (Edwards et al., 2025). Another major challenge is when AI is used as a tool for cognitive off loading, this impairs the development of critical thinking and creative writing abilities (Y. Fan et al., 2025). Hence, the best approach is to adopt a " human in loop approach" where in the students critically audits the output of AI as well as "teach the AI", hence ensuring that the student remain responsible for the intellectual work.

Methodology

This pilot study investigates Generative AI (GenAI) as a "Digital Mentor" in hospitality education, framed through Vygotsky's (1978) Zone of Proximal Development (ZPD) and the Unified Theory of Acceptance and Use of Technology (UTAUT)(Venkatesh et al., 2003). A convenience sample of final-year Bachelor of Hotel Management (BHM) students (N = 44) was surveyed at St. Joseph's Institute of Hotel Management & Catering Technology, Palai.

The survey instrument operationalized six constructs measured on a 5-point Likert scale. These were categorized into four Mentorship Dimensions namely Cognitive Scaffolding (CS), Student Independence (IS), Critical Thinking (CT), and Psychological Support (PS) and two Engagement Antecedents: AI Adoption (AS) and Trust Score (TS). The statistical analysis was done using JASP 0.95.4.

Reliability

Table 1. Reliability Analysis of Research Constructs (n=44)

Construct	Items	α	Interpretation
Cognitive Score (CS)	5, 6, 7, 8	0.84	Good
Independence Score (IS)	17, 18, 19, 20	0.81	Good
Critical Thinking (CT)	12, 13	0.74	Acceptable
Adoption Score (AS)	21, 22, 23	0.70	Acceptable
Psychological Score (PS)	9, 10, 11	0.69	Modest/Acceptable
Trust Score (TS)	14, 15, 16	0.62	Poor/Exploratory

Except for Trust Score (α = 0.62), all constructs demonstrated good to acceptable internal consistency. Since reliability coefficients between 0.60 and 0.70 are deemed acceptable for exploratory pilot studies evaluating emergent constructs, the Trust Score (TS) was retained for preliminary analysis.

Hypothesis Statement

The following hypotheses were formulated:

- **H_{1a}:** There is a significant positive correlation between *AI Adoption (AS)* and *Cognitive Scaffolding (CS).*
- **H_{1b}:** Students with higher *AI Adoption (AS)* scores will report higher levels of *Student Independence (IS).*
- **H_2:** Higher levels of *Critical Thinking (CT)* are positively associated with a student's *Trust (TS)* in the AI's academic reliability.
- **H_3**: There is a significant difference in perceived *Psychological Support (PS)* scores between students using Laptops and those using Smartphones.
- **H_4:** Higher perceived *Cognitive Scaffolding (CS)* leads to a significant increase in *Student Independence (IS).*

Findings

Demographic Profile

Table 2. Demographic Profile of Respondents (n = 44)

Category	Group	Frequency	Percentage
Gender	Male	42	95%
	Female	2	5%
	Total	**44**	**100%**
Age group	17–19 years	0	0%
	20–22 years	38	86%
	23–25 years	6	14%
	Above 25 years	0	0%
	Total	**44**	**100%**
Education	UG	44	100%
	PG	0	0%
	PhD	0	0%
	Total	**44**	**100%**
Primary Device	Smartphone	35	80%
	Laptop/Desktop	9	20%
	Tablet	0	0%
	Total	**44**	**100%**

All 44 respondents (100%) were final-year undergraduate hospitality students. The cohort was predominantly male (95.5%, n = 42; female: 4.5%, n = 2) and concentrated in the 20–22 age bracket (86.4%, n = 38; ages 23–25: 13.6%, n = 6). Smartphones served as the primary interface for accessing AI tools for 79.5% (n = 35) of students, while 20.5% (n = 9) used laptops or desktops.

Descriptive Statistics & Normality Test for the Constructs

Table 3. Descriptive Statistics and Normality Tests for Research Constructs

	AS	IS	TS	CT	PS	CS
Valid	44	44	44	44	44	44
Missing	0	0	0	0	0	0
Median	3.667	3.333	3.000	3.500	3.000	3.625
Mean	3.697	3.212	3.030	3.557	3.273	3.517
Std. Deviation	0.764	0.951	0.736	0.809	0.904	0.898
IQR	1.083	1.667	0.750	1.000	1.333	1.313
Skewness	-0.117	0.015	0.409	0.015	0.055	-0.168
Std. Error of Skewness	0.357	0.357	0.357	0.357	0.357	0.357
Shapiro-Wilk	0.963	0.969	0.967	0.947	0.964	0.965
P-value of Shapiro-Wilk	.164	.270	.228	.042	.190	.194
Minimum	1.667	1.333	1.667	2.000	1.000	1.750
Maximum	5.000	5.000	5.000	5.000	5.000	5.000

Shapiro-Wilk normality tests confirmed normal distribution across AS (p = .164), IS (p = .270), TS (p = .228), PS (p = .190), and CS (p = .194). Although CT showed a minor departure from normality (W = 0.947, p = .042), its near-zero skewness (0.015) and sample size (N > 30) justified parametric analysis.

Pearson's Correlation Analysis

Table 4. Descriptive Statistics and Pearson Correlation Matrix (N = 44)

Construct	Mean	SD	1 (AS)	2 (CS)	3 (IS)	4 (CT)	5 (TS)	6 (PS)
1. Adoption (AS)	3.70	0.76	—					
2. Scaffolding (CS)	3.52	0.90	.802***	—				
3. Independence (IS)	3.21	0.95	.542***	.472***	—			
4. Critical Thinking (CT)	3.56	0.81	.681***	.763***	.261*	—		
5. Trust Score (TS)	3.03	0.74	.398**	.372**	.264*	.342*	—	
6. Psychological Support (PS)	3.27	0.90	.658***	.567***	.541***	.450**	.146	—

** p < .05, ** p < .01, *** p < .001 (one-tailed).*

We found a significant positive correlation between Adoption (AS) and Cognitive Scaffolding (CS), r (42) = .802, p <.001. Adoption (AS) and Independence (IS), r (42) = .542, p <.01. Critical Thinking (CT) and Trust Score (TS), r (42) = .342, p <.011. Cognitive Scaffolding (CS) and Independence (IS), r (42) = .472, p <.001. Thus, the H_{1a}, H_{1b}, H_2 and H_4 are supported and correlation analysis strongly validates the Digital Mentor model's hypothesised relationships.

Independent Sample T- Test

An independent samples t-test evaluated whether primary hardware interface affected perceived Psychological Support. Parametric assumptions were confirmed: residuals were normally distributed (Shapiro-Wilk W = 0.973, p = .396) and group variances were equal (Levene's F = 0.677, p = .415).

Table 5. Independent Samples t-Test for Hardware Interface vs. Psychological Support

Group	n	Mean	SD	SE	t	df	p (two-tailed)
Smartphone	35	3.16	0.92	0.16	−1.634	42	.110
Laptop/Desktop	9	3.70	0.72	0.24	—	—	—

Note. Equal variances assumed. Welch's t(15.63) = −1.900, p = .076.

Participants using laptops/desktops reported higher mean scores for Psychological Support (M = 3.70, SD = 0.72) than those using smartphones (M = 3.16, SD = 0.92), the t-test revealed no significant difference between the two groups, t(42) = -1.634, p = .110 (two-tailed). Consequently, H_3 is not supported.

Conclusion

The study found significant positive correlation between the constructs with a robust correlation between Adoption (AS) and Scaffolding (CS), r = .802, p < .001— demonstrating that AI adoption is integral to digital mentorship. Further a significant positive correlation between *Cognitive Scaffolding (CS)* and *Independence (IS)*, r = .472, p < .001 – indicates that scaffolding can lead to independent learning. However, type of device used showed no statistically significant effect on perceived psychological support (PS), p = .110. This indicates that smartphone can be the media for integrating the digital mentor in hospitality education. However, educators must ensure AI is deployed to enhance inquiry rather than facilitate passive cognitive offloading. Hospitality faculty should adopt a structured "human-in-the-loop" (Mollick & Mollick, 2023) approach, designing coursework that requires students to critically evaluate, prompt-engineer, and verify AI outputs. These developmental safeguards will ensure that the students move through the zone of proximal development effectively and quickly with the aid of the "digital mentor".

Limitations of the study

Even though the study established significant positive correlations there are few limitations to be acknowledged. The modest sample size (N = 44) drawn from a single institution limits external validity. The cohort also reflects notable demographic imbalances: female students represent only 4.5% (n = 2) of respondents; though it is typical of hotel management colleges to have fewer female students. Similarly, the hardware disparity (35 smartphone users vs. 9 laptop users) constrained statistical power in evaluating device-dependent psychological effects. The self-report survey measures perceived autonomy rather than objective academic achievement gains. The Trust Score exhibited exploratory-level reliability ($\alpha = .62$), indicating that future iterations should decouple trust into distinct sub-dimensions of technical/factual accuracy (resistance to hallucinations) and pedagogical guidance, these shall also include negative worded questions to eliminate acquiescence bias.

A planned one-way ANOVA evaluating Cognitive Scaffolding across Usage Frequency categories was also omitted due to sample constraints. Severe category sparsity, minimal variance among participants, and subsequent violations of homogeneity of variance (Levene's test) precluded stable between-group comparisons. Consequently, the bivariate correlation between AI Adoption and Cognitive Scaffolding, $r = .802$, $p < .001$ was retained as an empirical proxy, effectively capturing how habitual integration underpins the mentoring dynamic.

Scope for Further Studies

A longitudinal study may be designed to track the ZPD with the aid of Gen AI tools, over an entire academic year. The trust construct can be refined; by sub dividing the construct to Epistemic / Factual Trust (Technical Reliability) and Pedagogical / Instructional Trust (Guidance Reliability). Further studies can be conducted to understand the effect of different AI personas and its effectiveness in mentoring. Finally, an experimental design may be designed for assessing the influence of device type on psychological support.

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