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The Impact of Generative AI on Intrinsic Learning Motivation and Perceived Learning Outcomes

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Paper [30] · Track [1] · Room [A] · [15:35 – 16:00], 28 August 2026

OUTLINE

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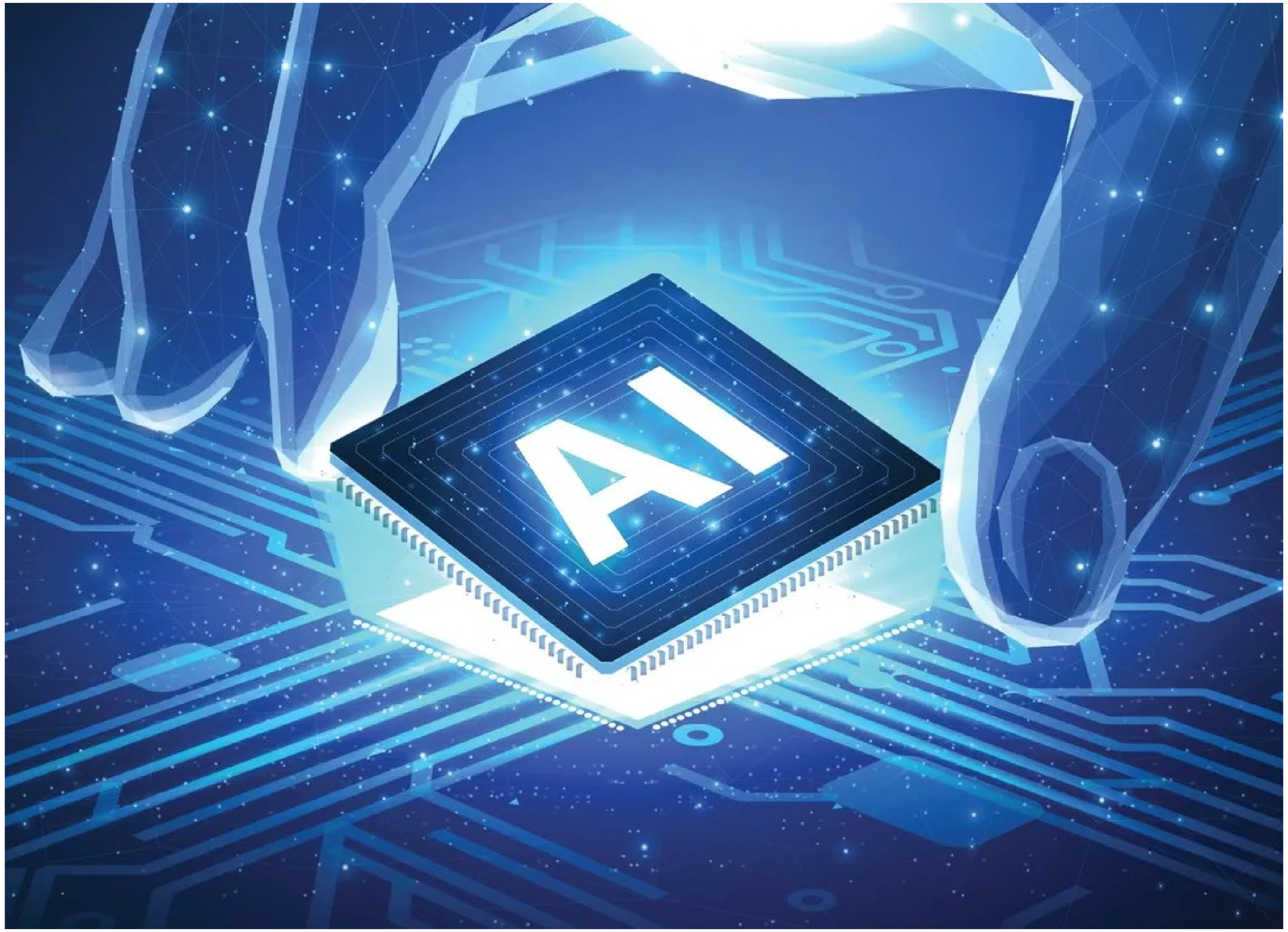


01

Introduction

More capable GenAI always improve learning outcomes?

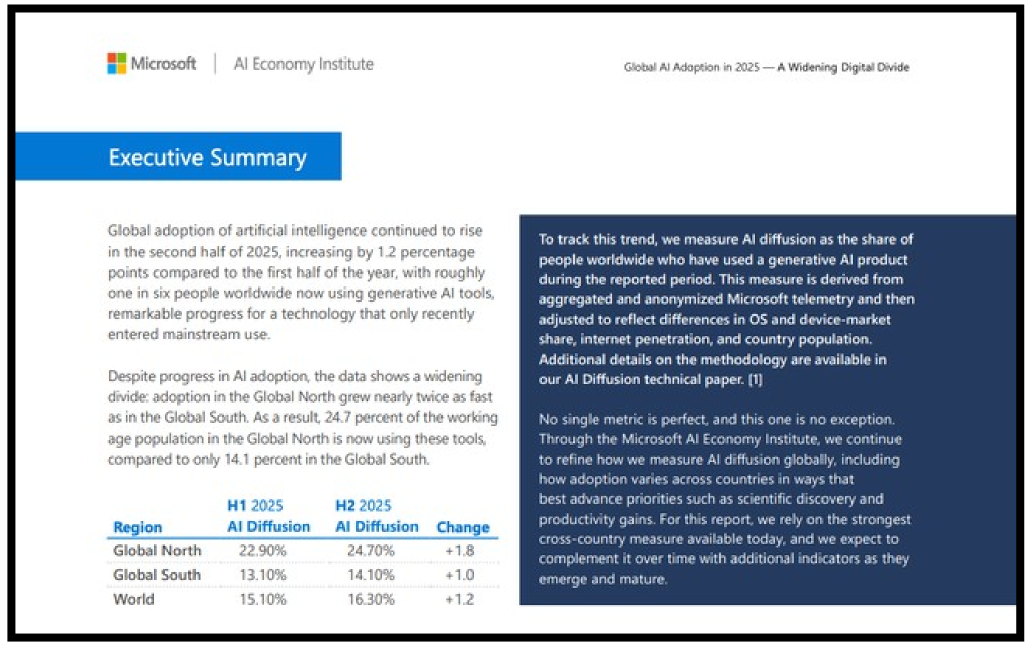
~16.3% of **global population uses GenAI for learning and work** (Microsoft, 2025)

GenAI is becoming increasingly capable: summarizing, writing code, and solving problems within seconds (S. Panke, 2025)

This trend is increasingly in **Vietnam's higher education digital transformation, demands technical proficiency for workforce competitiveness** (Resolution No. 71-NQ/TW, 2025)

While **GenAI can do more** for students, **goals of education** are still **developed learners' actual own knowledge, skills, attitudes**, and **ability to learn independently**

Does a more capable GenAI always help students develop better? Or could it, in some cases, reduce their motivation and learning outcomes?



Microsoft | AI Economy Institute

Global AI Adoption in 2025 — **A Widening Digital Divide**

Executive Summary

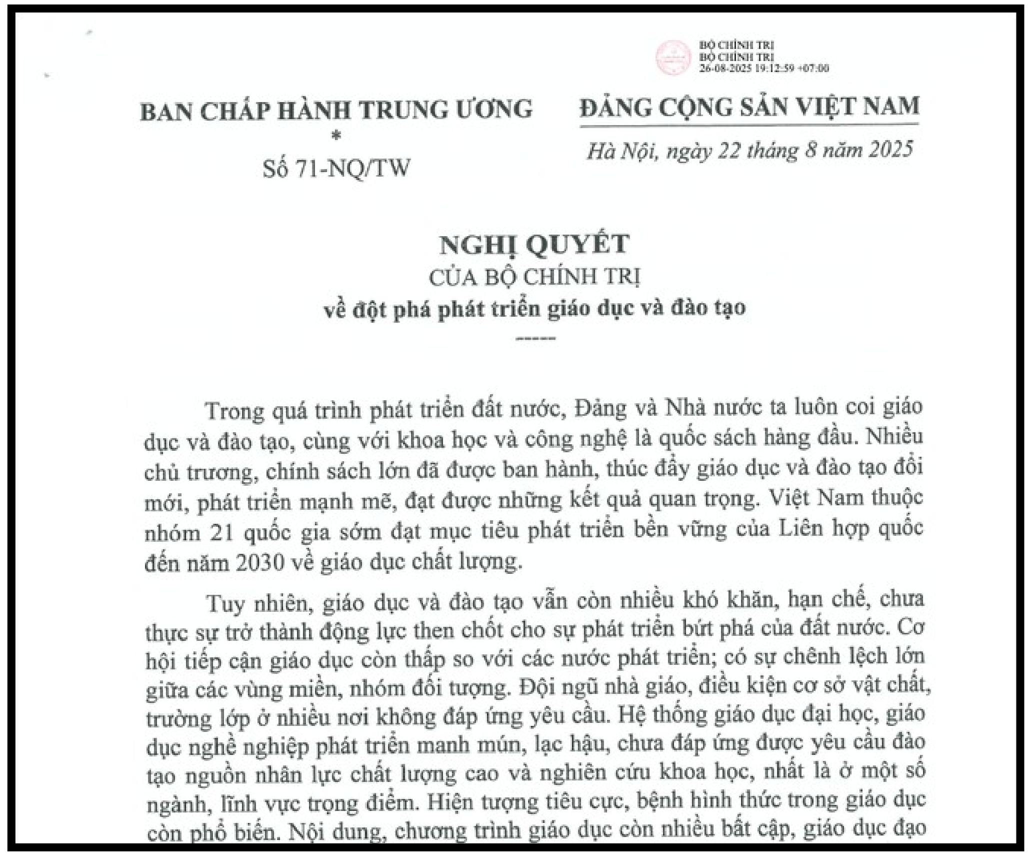
Global adoption of artificial intelligence continued to rise in the second half of 2025, increasing by 1.2 percentage points compared to the first half of the year, with roughly one in six people worldwide now using generative AI tools, remarkable progress for a technology that only recently entered mainstream use.

Despite progress in AI adoption, the data shows a widening divide: adoption in the Global North grew nearly twice as fast as in the Global South. As a result, 24.7 percent of the working age population in the Global North is now using these tools, compared to only 14.1 percent in the Global South.

Region	H1 2025 AI Diffusion	H2 2025 AI Diffusion	Change
Global North	22.90%	24.70%	+1.8
Global South	13.10%	14.10%	+1.0
World	15.10%	16.30%	+1.2

To track this trend, we measure AI diffusion as the share of people worldwide who have used a generative AI product during the reported period. This measure is derived from aggregated and anonymized Microsoft telemetry and then adjusted to reflect differences in OS and device-market share, internet penetration, and country population. Additional details on the methodology are available in our AI Diffusion technical paper. [1]

No single metric is perfect, and this one is no exception. Through the Microsoft AI Economy Institute, we continue to refine how we measure AI diffusion globally, including how adoption varies across countries in ways that best advance priorities such as scientific discovery and productivity gains. For this report, we rely on the strongest cross-country measure available today, and we expect to complement it over time with additional indicators as they emerge and mature.



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Số 71-NQ/TW

ĐẢNG CỘNG SẢN VIỆT NAM
Hà Nội, ngày 22 tháng 8 năm 2025

NGHỊ QUYẾT
CỦA BỘ CHÍNH TRỊ
về đột phá phát triển giáo dục và đào tạo

Trong quá trình phát triển đất nước, Đảng và Nhà nước ta luôn coi giáo dục và đào tạo, cùng với khoa học và công nghệ là quốc sách hàng đầu. Nhiều chủ trương, chính sách lớn đã được ban hành, thúc đẩy giáo dục và đào tạo đổi mới, phát triển mạnh mẽ, đạt được những kết quả quan trọng. Việt Nam thuộc nhóm 21 quốc gia sớm đạt mục tiêu phát triển bền vững của Liên hợp quốc đến năm 2030 về giáo dục chất lượng.

Tuy nhiên, giáo dục và đào tạo vẫn còn nhiều khó khăn, hạn chế, chưa thực sự trở thành động lực then chốt cho sự phát triển bứt phá của đất nước. Cơ hội tiếp cận giáo dục còn thấp so với các nước phát triển; có sự chênh lệch lớn giữa các vùng miền, nhóm đối tượng. Đội ngũ nhà giáo, điều kiện cơ sở vật chất, trường lớp ở nhiều nơi không đáp ứng yêu cầu. Hệ thống giáo dục đại học, giáo dục nghề nghiệp phát triển manh mún, lạc hậu, chưa đáp ứng được yêu cầu đào tạo nguồn nhân lực chất lượng cao và nghiên cứu khoa học, nhất là ở một số ngành, lĩnh vực trọng điểm. Hiện tượng tiêu cực, bệnh hình thức trong giáo dục còn phổ biến. Nội dung, chương trình giáo dục còn nhiều bất cập, giáo dục đạo

What has been tried, and the gap

Benefits

- **Money, time, and cognitive effort** (M. Hmoud et al., 2024)
- **Self-efficiency** (N. N. Ye, 2025) (Y.-J. Chen et al., 2025)

Drawbacks

- **Learning motivation, critical thinking, and social interaction** (S. Wu et al., 2025)

Higher academic scores ≠ **Actual knowledge application** (Y. Fan et al., 2024)

Positive learning experience ≠ **Academic growth** (L. Fan et al., 2025)

Two Main Approaches:

Approach 1: Inheriting **TAM** to examine **Perceived Ease of Use, Perceived Usefulness & attitudes, behavioral intentions to use GenAI**

(N. T. T. Thúy et al., 2024), (N. T. P. Anh and T. N. Ghi, 2025)

Approach 2: GenAI's effects on the **learning process: motivation, engagement, higher-order thinking, self-efficiency and academic performance**

(R. Yilmaz and F. G. K. Yilmaz, 2023)

Previous works: GenAI → one general technology
Learner's experience → different characteristics of the technology

Shift in perspective: unified technology → multi-dimensional learning experience

Lacks an integrated framework examines & connecting these characteristics to learning outcomes via intrinsic motivation

Research questions:

RQ1

How do the different multidimensional characteristics of GenAI (PU, PEOU, PC, PA, PP) relate to students' intrinsic learning motivation?

RQ2

Does intrinsic learning motivation serve as a mediating mechanism linking the GenAI experience with perceived learning outcomes?

RQ3

Do these relationships change depending on the learner's GenAI proficiency?

02

Theoretical backgroud & Hypothesis

Integrating **TAM factors** with **three representative characteristics of GenAI :**

Perceived Usefulness (PU) **Perceived Creativity (PC)** **Perceived Accuracy (PA)**

Perceived Ease of Use (PEOU) **Perceived Personalisation (PP)**

Perceived Learning Outcomes: students' **own evaluation** of the knowledge, skills, and attitudes

Our study mainly draws on two theories:

Self-Determination Theory (SDT): Intrinsic motivation is **supported** when **three** needs are satisfied: **autonomy, competence, and relatedness**

Expectancy-Value Theory (EVT): Stronger motivation encourages students to **invest more effort** and **remain engaged** in learning

GenAI Proficiency: learners' **ability** to **critically evaluate, communicate, collaborate,** and **effectively work with GenAI**

Research model

Base on SDT, 5 GenAI characteristics are associated with ILM by supporting learners' psychological needs:

- **PU & PA:** Strengthen **competence**
- **PEOU:** Support **competence** and **autonomy**
- **PC:** Enhance **autonomy** and **competence**
- **PP:** Support **autonomy** and **relatedness.**

Based on EVT: ILM is expected to positively relate to PLO

GP is a moderator that may change how these characteristics relate to ILM

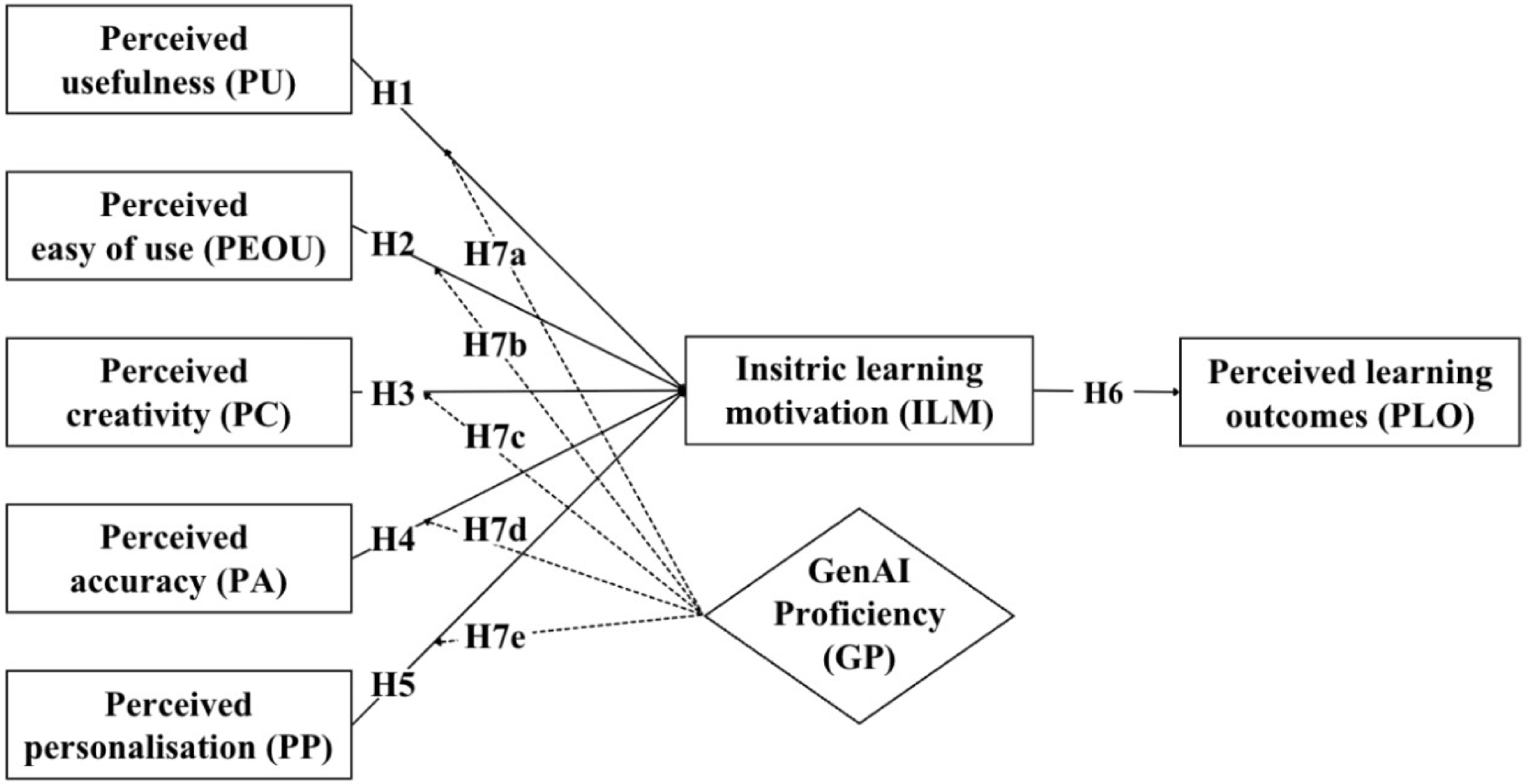

Fig. 1. Proposed Research Model

H1: PU is associated with ILM
H2: PEOU is associated with ILM
H3: PC is associated with ILM
H4: PA is associated with ILM
H5: PP is associated with ILM
H6: ILM is associated with PLO

H7a: GP moderates the impact of PU on ILM
H7b: GP moderates the impact of PEOU on ILM
H7c: GP moderates the impact of PC on ILM
H7d: GP moderates the impact of PA on ILM
H7e: GP moderates the impact of PP on ILM

03

Methodology

Research design

Pilot study
154 students

Main online survey
462 responses

Data screening
349 valid responses

CFA
Assess the measurement model

SEM
Structural relationships

Bootstrapping
Examine the indirect effects

Study method, participants, measures & analytical tools

1

Stage 1: Pilot Study

Pilot Study (n = 154): Conducted with students who had used at least one GenAI tool for learning purposes
⟶ To test question clarity, scale suitability, and initial reliability

2

Stage 2: Formal Study

Formal Study (n = 462): Online survey distributed across social media, digital learning communities, academic groups, and university-issued student emails in Vietnam. Conducted over three weeks. Yielded **349/ 462 valid responses**

PARTICIPANT

Primarily Gen Z students from higher education institutions in Vietnam, gender fairly balanced & mainly from urban areas

MEASUREMENT SCALES & ANALYTICAL TOOLS

- **Measurement**: Adapted scales, 5-point Likert scale
- **Data analysis**: SPSS 26 & AMOS 24
- **Method: CFA:** Assess the measurement model, reliability, and validity → **SEM:** Test the proposed structural relationships and hypotheses → **Bootstrapping (5,000 resamples):** Test indirect effects

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Results

The overall model fit also met the recommended criteria.

Table 1. Model Fit Indices Results

	Index	Assesment
CMIN/DF	1.315	Very good (<2)
GFI	0.928	Good (> 0.9)
CFI	0.983	Very good (> 0.9)
TLI	0.981	Very good (> 0.9)
RMSEA	0.030	Very good (< 0.05)

CFI = 0.983
TLI = 0.981
RMSEA=0.030

→ The measurement model provided a robust foundation to proceed with the structural model testing

Table 2. Reliability, Convergent Validity, and Discriminant Validity Results

Factor	Cronbach's Alpha	CR, AVE, MSV			Fornell & Lacker						
		CR	AVE	MSV	PU	PEOU	PC	PA	PP	ILM	PL
PU	0.867	0.872	0.633	0.154	**0.796**						
PEOU	0.901	0.904	0.702	0.029	0.091	**0.838**					
PC	0.873	0.874	0.698	0.272	-0.126	-0.095	**0.836**				
PA	0.881	0.886	0.723	0.100	0.057	0.043	-0.134	**0.850**			
PP	0.853	0.855	0.663	0.154	0.295	0.039	-0.141	0.202	**0.814**		
ILM	0.844	0.844	0.576	0.272	0.393	0.169	-0.522	0.317	0.392	**0.759**	
PL	0.925	0.924	0.708	0.175	0.143	0.062	-0.217	0.128	0.198	0.418	**0.841**

Cronbach's Alpha > 0.7
Factor loadings > 0.6
CR > 0.7
AVE > 0.5
MSV < AVE

→ All constructs achieved satisfactory reliability, convergent validity, and discriminant validity.

Overall, five of the six direct hypotheses were supported

Table 3. Hypothesis Testing Results

Hypothesis		β	P-Value	Result
H1	PU → ILM	0.254	0.000	Supported
H2	PEOU → ILM	0.088	0.074	Rejected
H3	PC→ ILM	-0.424	0.000	Supported
H4	PA→ ILM	0.197	0.000	Supported
H5	PP→ ILM	0.217	0.000	Supported
H6	ILM→ PL	0.418	0.000	Supported

#1. Positive associations with ILM: PU (β = .254) > PP (β = .217) > PA (β = .197)

#2. No significant association: PEOU (β = .088, p = .074)

#3. Negative association with ILM: PC (β = −.424)

#4. Positive association with PLO: ILM (β = .418)

Indirect Effects and the Mediating Role of Intrinsic Learning Motivation

- **Significant indirect effects**: PU, PP, PA, PC → ILM → PLO
- The indirect effect of PEOU was not statistically significant.

Table 4. Results of the Indirect Effects Analysis through the Mediating Variable ILM

Indirect Path	β	P-Value (BC)	Conclusion
PU → ILM → PL	0.106	0.000	Supported
PP → ILM→PL	0.091	0.000	Supported
PA → ILM→ PL	0.082	0.000	Supported
PEOU → ILM→ PL	0.037	0.059	Not supported
PC → ILM→ PL	-0.177	0.000	Supported

The Moderating Role of AI Proficiency

- **Creativity → IM:** Negative effect weakens with higher AI proficiency.
- **Accuracy → IM**: Effect becomes less important with higher AI proficiency.

Table 5. Moderation Result

	Estimate	S.E.	C.R.	P
ILM ← INTpu	-.100	.054	-1.848	.065
ILM ← INTpeou	.036	.055	.659	.510
ILM ← INTpc	.131	.048	2.757	.006
ILM ← INTpa	-.147	.050	-2.942	.003
ILM ← INTpp	-.082	.049	-1.658	.097

05

Discussion

What the results mean

What we found

- Usefulness, personalization, and accuracy actively drive intrinsic motivation.
- Ease of use is now a basic expectation for Gen Z, not a direct motivator.
- Excessive AI creativity turns active learners into passive selectors.

What it means

- Supports Self-Determination Theory (competence, autonomy & relatedness).
- Tools must deliver actual learning value beyond just a good UX.
- Educators must balance AI assistance to preserve student ownership.

GenAI motivates when it builds competence, but over-automating creativity risks turning active creators into passive consumers.

What the results mean

What we found

- High proficiency weakens the negative impact of excessive AI creativity.
- Low proficiency increases reliance on accurate AI outputs for motivation.
- Intrinsic motivation mediates the overall educational value of GenAI.

What it means

- Students need skills to guide, evaluate, filter, and control AI-generated content., not just use it.
- Proficiency shifts learners from dependent users to autonomous directors.
- Value depends on psychological engagement, not just tech capabilities.

GenAI proficiency doesn't just make AI better; it gives learners the control needed to maintain autonomy and motivation.

What this study does not settle

Limitations

- **Sample Bias:** The study focuses predominantly on Gen Z undergraduates, limiting generalizability to broader populations.
- **Disciplinary Aggregation:** Does not clearly classify students by academic majors; perceptions are pooled from various universities.
- **Subjective Metrics:** Findings rely heavily on self-perceived assessments rather than objective learning outcomes.
- **Cross-sectional Nature:** Cannot definitively prove long-term causal relationships.

Next steps

- Broaden the demographic scope to test findings across different learner profiles.
- Run one-way ANOVA and analyze by group to examine how perceptions differ across academic disciplines.
- Incorporate objective academic metrics (e.g., GPA, test scores) to verify perceived outcomes.
- Employ longitudinal or experimental designs to establish clear causal mechanisms.

06

Conclusion

Three things to take away

01 **Multidimensional Experience**

GenAI is more than a single tool; it is a complex learning experience.

02 **The Role of Motivation**

Intrinsic motivation is the crucial bridge between AI features and learning outcomes.

03 **Proficiency Dictates Experience**

GenAI is more than a single tool; it is a complex learning experience.

Practical Implications

- **Beyond Access & Prompts:**

  Universities must teach students to critically evaluate, verify, and strategically guide AI, not just use it.

- **Human-Centered Design:**

  System evaluation should prioritize designs that preserve learner autonomy and active cognitive engagement over raw technological power.

OUR FINDINGS SUGGEST THAT:

*"The **key question** is not just how to **develop AI that can do more**, but how to **use AI to help learners do more**."*

GenAI should be used to extend human capacity while preserving learners' autonomy, motivation, and active agency.

Thank you

Questions welcome

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