

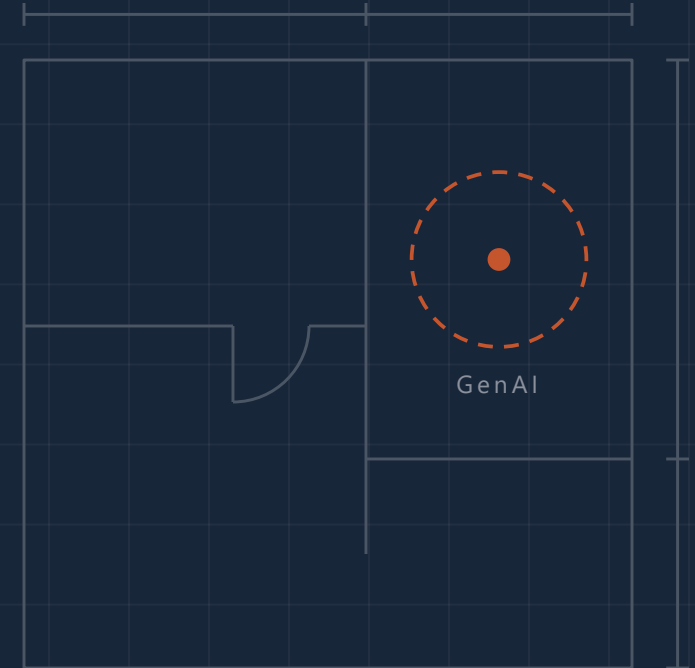
PAPER PRESENTATION

On the Acceptance and Use of *Generative AI* in Architecture and Interior Design Education in Vietnam

Extending the Technology Acceptance Model with Domain Knowledge and Prompt Engineering Self-Efficacy

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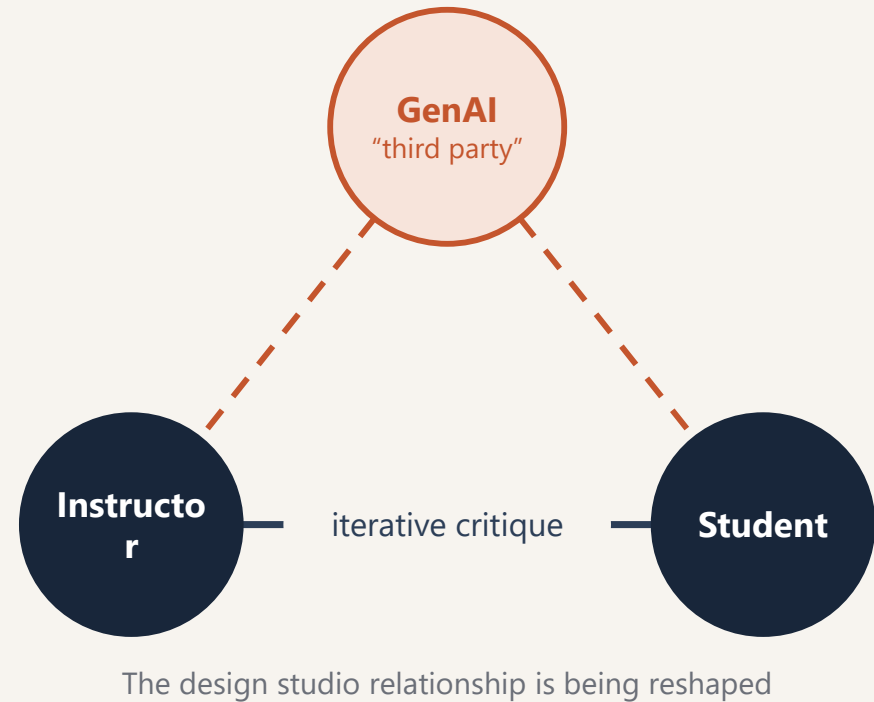


From peripheral curiosity to *mandated competency*

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Digital competency and AI knowledge become a **compulsory learning outcome** for every university graduate in Vietnam.

- ◇ Architecture & interior design are taught through an **apprenticeship model**: judgment is transmitted by iterative critique (Schön, 1987).
- ◇ GenAI tools (ChatGPT, Gemini, Claude, Midjourney...) generate text, imagery and spatial concepts from prompts.
- ◇ The mandate arrives **without a settled pedagogy** for design studios.



GenAI in the studio: *how it behaves in practice*

01

Enthusiasm fades

Students using Midjourney or Stable Diffusion are enthusiastic in early concept generation, less so in development and final presentation, and expect AI use to be disclosed [3], [6].

02

Prompting is the bottleneck

AI is most valuable when problems are still ill-defined, but only if students can distil their design intent into a workable prompt, which many struggle to do regardless of computer fluency [4].

03

Bias & distraction

Text-to-image output carries biases and can pull attention away from the architectural qualities students are meant to learn and judge.

Whether GenAI proves useful and easy is **not about the tool alone**. It depends on what the student already knows, both about **design** and about **operating the tool through language**.

No acceptance model yet for *design students*

- ◇ GenAI–TAM studies concentrate on **general** student and faculty populations.
- ◇ Where architecture is studied, the sample is mostly **instructors** [5].
- ◇ Student-facing studies are **descriptive or correlational**, not model-based [6].
- ◇ **No study** has modelled GenAI acceptance among architecture / interior design students in Vietnam, even though national policy now requires AI competency for all graduates.

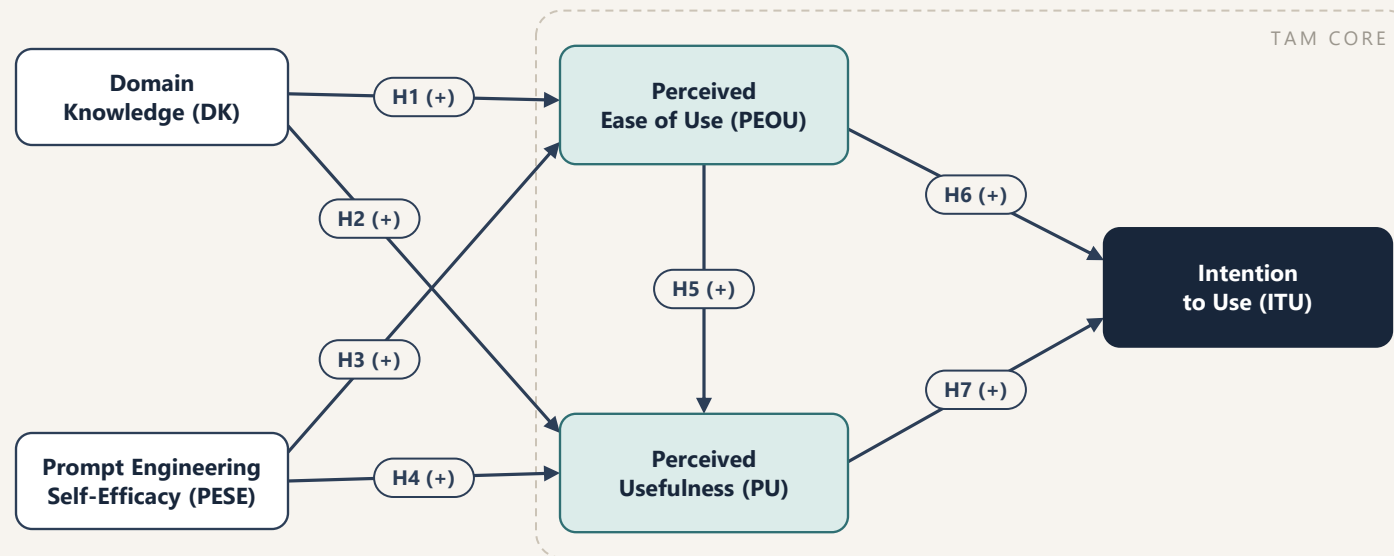
RQ1

Do **domain knowledge** and **prompt engineering self-efficacy** positively predict perceived usefulness and perceived ease of use of GenAI tools among architecture and interior design students?

RQ2

Do **perceived usefulness** and **perceived ease of use**, in turn, positively predict intention to use GenAI tools in design coursework?

TAM extended with two *knowledge-side* antecedents



Domain Knowledge (DK)

Disciplinary competence needed to judge whether a generated design solution is appropriate. Proposed antecedent; items self-developed.

Prompt Engineering Self-Efficacy (PESE)

Confidence to translate design intent into effective natural-language instructions [11], [12].

H1–H4: antecedents → PEOU / PU

H5–H7: TAM core (PEOU → PU, PEOU → ITU, PU → ITU)

Sample and analytic approach

169

usable responses (undergraduates)

3

universities in Ho Chi Minh City

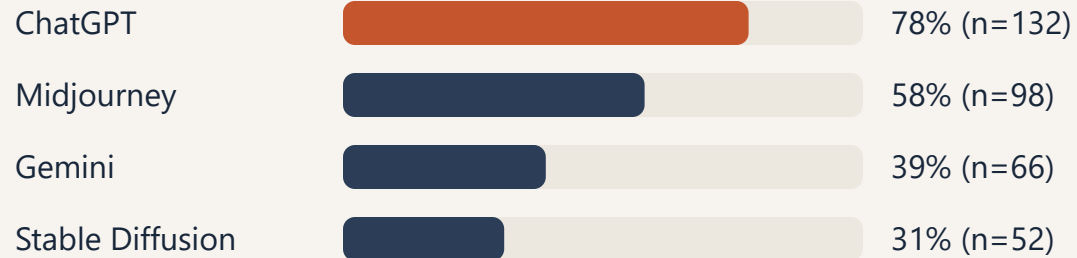
17

items · 5 constructs · 5-point Likert

0

students with formal AI-literacy or prompt-engineering training

PRIOR GENAI EXPERIENCE



- ◇ **Sites:** University of Architecture HCMC · Architecture, Ton Duc Thang University · Interior Design, Hoa Sen University
- ◇ **Items** adapted from Davis [7] and Gibreel & Arpaci [12]; DK self-developed
- ◇ **PLS-SEM**, SmartPLS 4.1.1.8: exploratory DK construct, prediction focus [14]
- ◇ **5,000 bootstrap** subsamples, two-tailed, $\alpha = 0.05$; f^2 , R^2 , Q^2

Reliable and valid: *all criteria met*

CRITERION	THRESHOLD	OBSERVED	
Outer loadings (λ)	≥ 0.708	0.739 – 0.947 (all $p < .001$)	✓
Outer VIF	< 5	1.550 – 4.783	✓
Cronbach’s α	≥ 0.70	0.817 (ITU) – 0.933 (PESE)	✓
Composite reliability ρ_c	≥ 0.70	0.880 – 0.957	✓
AVE	≥ 0.50	0.647 – 0.880	✓
HTMT	≤ 0.85	max 0.566 (PEOU–ITU)	✓
Fornell–Larcker	$\sqrt{AVE} > r$	met for all constructs	✓
Inner VIF	< 3	1.001 – 1.202	✓
SRMR (estimated model)	< 0.08	0.075 (saturated 0.055)	✓

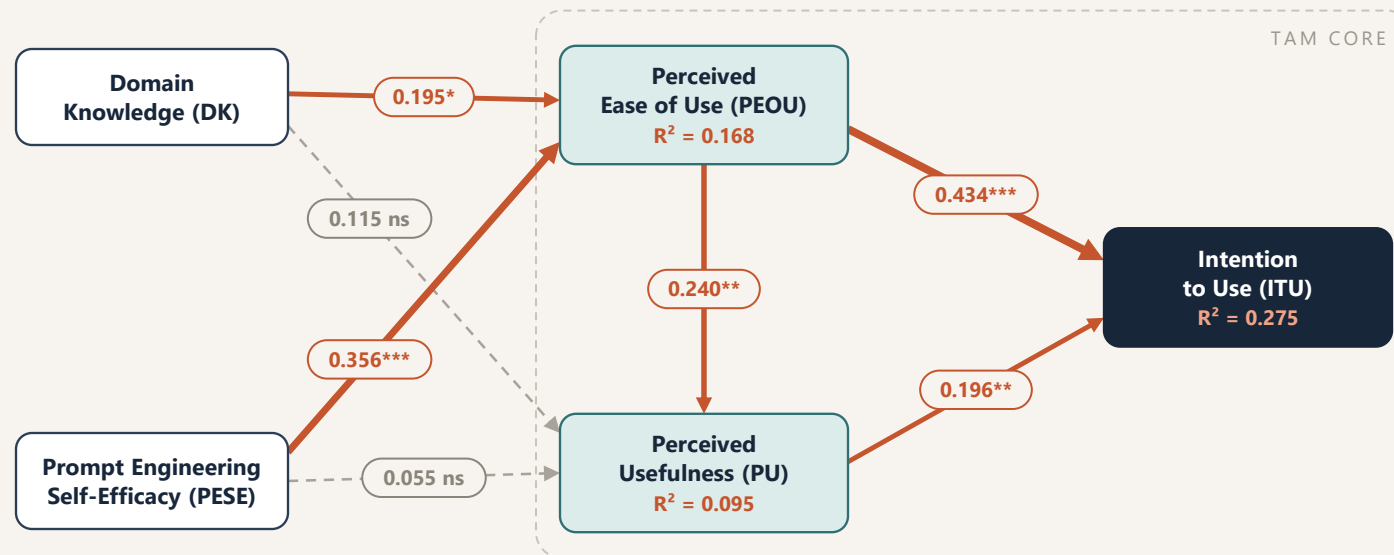
0.049

HTMT between DK and PESE

Disciplinary competence and prompting confidence are **close to orthogonal**. They are two separate capabilities, not two expressions of one.

Item means 3.34 – 3.72: moderate agreement, no floor or ceiling effects.

Estimated model: *ease of use* carries the weight



Variance explained (R^2)

ITU		27.5%
PEOU		16.8%
PU		9.5%

— significant (width $\propto \beta$)

- - not significant

* $p < .05$ · ** $p < .01$ · *** $p < .001$

Five of seven hypotheses *supported*

H	PATH	β	t	p	95% CI	f ²	DECISION
H1	DK → PEOU	0.195	2.066	.039	[0.006, 0.373]	0.046	Supported
H2	DK → PU	0.115	1.455	.146	[−0.042, 0.269]	0.014	Not supported
H3	PESE → PEOU	0.356	3.991	<.001	[0.192, 0.540]	0.153	Supported
H4	PESE → PU	0.055	0.529	.597	[−0.138, 0.271]	0.003	Not supported
H5	PEOU → PU	0.240	2.844	.005	[0.056, 0.392]	0.053	Supported
H6	PEOU → ITU	0.434	6.633	<.001	[0.305, 0.561]	0.239	Supported
H7	PU → ITU	0.196	2.628	.009	[0.053, 0.344]	0.049	Supported

Percentile bootstrap, 5,000 subsamples. f²: 0.02 small · 0.15 medium · 0.35 large (Cohen, 1988).

Both antecedents reach intention *through ease of use*

INDIRECT PATH	β	t	p	95% CI
PESE → PEOU → ITU	0.155	3.248	.001	[0.075, 0.260]
PESE → PEOU → PU	0.086	2.447	.014	[0.019, 0.160]
DK → PEOU → ITU	0.085	1.864	.062	[0.002, 0.182]
DK → PEOU → PU	0.047	1.661	.097	[-0.002, 0.108]
DK → PU → ITU	0.023	1.045	.296	[-0.005, 0.077]
PEOU → PU → ITU	0.047	2.056	.040	[0.006, 0.096]
Total indirect: PESE → ITU	0.182	3.216	.001	[0.083, 0.304]
Total indirect: DK → ITU	0.116	2.142	.032	[0.020, 0.231]

0.155

strongest mediated path in the model:
PESE → PEOU → ITU

Perceived ease of use, **not** perceived usefulness, is the carrying channel for **both** antecedents.

A reversal of TAM's *most replicated* finding

Classic TAM: usefulness is the dominant predictor of intention [7], [10]. Here:



3.68

PEOU mean (highest)

3.37

ITU mean (lowest)

9.5%

variance in PU explained

WHY? INTERPRETABLE, NOT ANOMALOUS

- ◇ TAM was built for **workplace systems** with a settled purpose and visible benefit.
- ◇ GenAI output in the studio is **open-ended**, and its quality **varies unpredictably** with the request.
- ◇ Its **legitimate standing** in assessed design work is not yet settled by institutions.

Students find the tools **easy**, and only **moderately useful**.

Knowing how to ask $\neq$ believing the answer is valuable

Prompt Engineering Self-Efficacy



Domain Knowledge



- ◇ **PESE** is by construction a belief about *operating* the system, so its translation into ease of use is close to definitional [11], [12].
- ◇ Confidence in phrasing a prompt does not mean confidence in the **value of what is returned**.
- ◇ **DK cuts both ways**: it reduces operational friction *and* sharpens critical evaluation. Architecture students have found text-to-image tools easy and enjoyable while doubting that image generation counts as architectural ideation [3].

Net effect of design knowledge on usefulness: **small and unstable**.

What this means for implementing *Circular No. 54*

✓ WHAT THE EVIDENCE SUPPORTS

- ◇ **Teach prompt formulation.** PESE has the largest antecedent effect and the strongest mediated path to intention ($\beta = 0.155$).
- ◇ Prompt-writing instruction should **precede**, not merely accompany, AI-assisted studio work [4].

X WHAT IT DOES NOT SUPPORT

- ◇ Assuming skills training will persuade students the tools are **useful**.
- ◇ Usefulness beliefs form **in the studio**: through output quality in assessed work, norms on AI-assisted submissions, and instructors' own positions [5], [6].

A compliance strategy built on **skills modules alone** raises ease of use, but leaves untouched the belief on which **sustained adoption** ultimately depends.

What this study *cannot* yet tell us

LIMITATIONS

- ◇ Domain knowledge was **self-reported**, without external validation.
- ◇ **Cross-sectional** design; we measured intention, not actual adoption or learning outcomes.
- ◇ Three universities in **Ho Chi Minh City**, so generalisability is limited.
- ◇ $n = 169$ is underpowered for **small effects on PU**: DK → PU is *unresolved*, not disconfirmed.

FUTURE RESEARCH

Actual behaviour

Longitudinal tracking of usage and design performance

Objective competence

External measures of design knowledge

Tool types

Separate text generators from image generators

Studio conditions

Model where usefulness beliefs are formed

CONCLUSION

Ease of use, *not* usefulness, drives design students' intention to use GenAI

- 1 Domain knowledge and prompt engineering self-efficacy both raise **perceived ease of use**; neither significantly raises perceived usefulness.
- 2 PEOU is the dominant driver of intention ($\beta = 0.434$ vs 0.196), reversing classic TAM. The model explains **27.5%** of ITU but only **9.5%** of PU.
- 3 Teach prompting, but also settle the **standing of AI-assisted work** in studio assessment.

Thank you

Questions & discussion

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