

Original Paper

When AI Translates: Skill Devaluation and Learner Boredom in Translation Classrooms for Application-Oriented EFL Majors

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Abstract

The integration of generative artificial intelligence (AI) into translation education has predominantly been celebrated for its capacity to enhance learner engagement and motivation. This study challenges that dominant narrative by investigating a countervailing possibility: that generative AI, by rendering translation skills seemingly redundant, may hollow out learners' perceived value of those skills and thereby breed boredom. Drawing on the Meaning and Attention Components (MAC) model of boredom (Westgate & Wilson, 2018), we propose and empirically test a pathway in which perceived AI-induced skill devaluation predicts translation classroom boredom through meaning deficits, with the attention pathway (challenge-skill imbalance) serving as a competing explanation. Using an explanatory sequential mixed-methods design with 326 application-oriented EFL translation majors in China, we found that: (a) perceived AI skill devaluation significantly predicted translation classroom boredom; (b) meaning deficits fully mediated this relationship; and (c) the meaning pathway exerted significantly stronger effects than the attention pathway. Qualitative interviews with 18 participants corroborated these findings, revealing narratives of "why bother learning what AI can do." This study introduces the construct of meaning-deficit boredom in AI-era translation classrooms, extends the MAC model to foreign language education, and offers a critical boundary condition to the engagement-dominant AI narrative.

Keywords

generative AI, translation education, skill devaluation, boredom, MAC model, EFL learners, application-oriented education

1. Introduction

The proliferation of generative artificial intelligence (GenAI) has fundamentally reshaped the landscape of translation education. Tools such as DeepL, ChatGPT, and Google Translate now produce translations that rival—and in some cases surpass—the quality of novice and even professional human translators (Jiao et al., 2023; Wu et al., 2024). For application-oriented English as a Foreign Language (EFL) majors—students whose curricula explicitly prioritize employability and practical skill acquisition—this technological shift poses an existential pedagogical challenge. If machines can translate instantly, accurately, and at negligible cost, what remains of the value of learning translation as a human skill?

A rapidly growing body of research celebrates AI's capacity to enhance learner engagement, motivation, and educational outcomes in language learning contexts (Huang et al., 2023; Kohnke et al., 2023; Liu & Ma, 2024). This “engagement-dominant narrative” posits that AI tools serve as scaffolds, feedback providers, and interactive partners that stimulate rather than stifle learner involvement. Yet this optimistic perspective overlooks a darker possibility: that the very proficiency of AI may generate a sense of skill redundancy—a perception that the skill one is laboring to acquire has been rendered obsolete or devalued by technology. Such perceptions, we argue, may engender a distinctive form of classroom boredom rooted not in task difficulty or monotony, but in a collapse of perceived meaning.

Foreign language boredom (FLB) has received substantial scholarly attention over the past decade, with control-value theory (CVT; Pekrun, 2006) serving as the dominant explanatory framework (Li, 2021; Li et al., 2023; Pawlak et al., 2020). CVT-oriented research has productively linked boredom to low control appraisals and low value appraisals, yet empirical applications have disproportionately emphasized the control/challenge dimension—that is, whether tasks are too easy, too difficult, or mismatched with learner competence (Li, 2021; Li et al., 2023). The value dimension—the sense that an activity matters, is worthwhile, or aligns with one's identity—remains comparatively underexplored in FLB scholarship. This gap becomes particularly consequential in AI-transformed classrooms, where value erosion may be the more psychologically salient mechanism.

To theorize this phenomenon, we turn to the Meaning and Attention Components (MAC) model of boredom (Westgate & Wilson, 2018), which proposes two independent pathways to boredom: the meaning pathway (failure to find meaning or value in an activity) and the attention pathway (mismatch between cognitive resources and task demands). Crucially, the MAC model conceptualizes boredom as an affective signal of meaning deficit or attentional failure, and allows for the empirical separation of these two routes. This dual-pathway architecture offers a sharper lens for examining AI-induced boredom than CVT alone, because it permits a direct test of whether the boredom experienced in AI-era translation classrooms is predominantly a meaning-deficit phenomenon—as our theoretical reasoning suggests—rather than a challenge-mismatch phenomenon emphasized by traditional FLB research.

This study therefore asks: **Does perceived AI-induced skill devaluation predict translation classroom boredom among application-oriented EFL majors, and is this relationship mediated by**

meaning deficits as specified by the MAC model?

We position our investigation as a critical counterpoint to the engagement-dominant AI narrative. Rather than asking how AI can be harnessed to reduce boredom—a well-trodden practical question—we ask whether AI itself, through its demonstration of superior translation capability, may paradoxically generate boredom by devaluing the very skills students are expected to master. This question is theoretically urgent and pedagogically consequential, yet remains empirically unanswered.

Our study makes three contributions. First, we introduce the construct of **meaning-deficit boredom in the AI-era translation classroom**—a form of boredom that originates not from challenge-skill mismatch but from perceived value collapse of translation skills. Second, we extend the MAC model to EFL/translation education, empirically testing the relative explanatory power of the meaning versus attention pathways. Third, we operationalize “perceived AI skill devaluation” as a measurable construct grounded in expectancy-value theory (Eccles & Wigfield, 2020), providing a new variable for future research on technology-induced motivational shifts.

We focus on application-oriented EFL translation majors in Chinese higher education institutions as a critical case. These students are explicitly trained for translation-related careers and are thus most vulnerable to perceptions of AI-induced skill redundancy. If the theorized mechanism operates anywhere, it should operate most strongly in this population—a logic of theoretical sampling that enhances the theoretical leverage of our findings (Flyvbjerg, 2006).

2. Literature Review

2.1 *GenAI in Language Learning: The Engagement-Dominant Narrative*

The past three years have witnessed an explosion of research examining generative AI’s pedagogical applications in language education. Systematic reviews and scoping studies have predominantly framed AI as an asset that enhances learner engagement, motivation, and achievement. Huang et al. (2023), in a comprehensive review, concluded that AI-powered tools facilitate personalized learning, provide immediate feedback, and create authentic communicative contexts that stimulate learner participation. Kohnke et al. (2023) documented how ChatGPT and similar tools serve as “conversational partners” that lower affective barriers and encourage sustained interaction. Liu and Ma (2024), examining Chinese EFL contexts, reported that AI-assisted writing instruction improved both product quality and process engagement.

This engagement-dominant narrative carries an implicit assumption: that technological proficiency in translation tasks benefits learners by offloading cognitive burden and enabling focus on higher-order skills. AI is portrayed as a supplement that enriches rather than replaces human competence. However, this narrative has been critiqued for its technological determinism and its neglect of learners’ subjective meaning-making processes (Selwyn, 2022). What happens, critics ask, when AI’s competence is perceived not as support but as substitution? When the machine’s performance renders human effort futile rather than facilitated?

Empirical investigations of this “dark side” remain scarce. A handful of studies have noted learner anxiety about AI replacing human translators (Zhao & Li, 2024), and some have documented resistance to AI adoption (Wang & Sun, 2023). Yet none have systematically examined how AI’s demonstration of competence might devalue learners’ perceived worth of their own developing skills, nor how such devaluation might translate into negative affective states such as boredom. This gap is precisely our point of departure.

2.2 Foreign Language Boredom and Its Saturation

Boredom in foreign language classrooms has emerged as a significant area of inquiry within second language acquisition emotion research. Following the “affective turn” in applied linguistics, scholars have investigated the prevalence, antecedents, and consequences of FLB across diverse instructional contexts (Li et al., 2023; Pawlak et al., 2020; Zawodniak et al., 2022).

Control-value theory (CVT; Pekrun, 2006) has dominated this landscape. CVT posits that achievement emotions arise from two core appraisals: control (perceived agency over activities and outcomes) and value (perceived importance or usefulness of activities). Boredom, within this framework, is understood as an emotion triggered by low control (e.g., tasks are too easy or too difficult) and/or low value (e.g., tasks are perceived as pointless). Li’s (2021) seminal study on Chinese university EFL classrooms found that boredom was most strongly predicted by low task value and under-challenge—findings replicated in subsequent research (Li et al., 2023; Zhang & Yu, 2023).

Yet despite CVT’s theoretical acknowledgment of value as a co-equal predictor, empirical FLB research has disproportionately operationalized and tested the control/challenge pathway. Standard FLB instruments, such as the Foreign Language Learning Boredom Scale (FLLBS; Li et al., 2023), emphasize items about task difficulty, repetitiveness, and pace—indicators more aligned with the attention pathway in MAC terms than the meaning pathway. The value dimension, though statistically included, is often treated as a secondary or diffuse factor (Li et al., 2023, Table 3). This measurement asymmetry means that FLB research has inadvertently privileged attention-related explanations over meaning-related explanations.

A notable exception is the mixed-methods study by Zawodniak et al. (2022), which identified “lack of meaning” as a distinct boredom theme in Polish EFL classrooms. However, their analysis remained descriptive rather than theory-testing, and did not examine the specific role of technology in generating meaning deficits. More critically, no FLB study to date has engaged with the MAC model’s dual-pathway architecture as a competing or complementary framework to CVT. This theoretical silence is unfortunate, as the MAC model offers a more precise articulation of how value deficits produce boredom—not merely as an appraisal but as a dynamic process of meaning-failure that can be empirically decoupled from attention-failure.

Thus, FLB research, while rich in descriptive accounts, stands in need of theoretical refinement and contextual updating. The AI-transformed classroom may be a context where the meaning pathway becomes unusually salient—a possibility that existing FLB frameworks, biased toward

attention/challenge explanations, are ill-equipped to capture.

2.3 AI, Deskillling, and Skill Devaluation

The concept of deskilling—the process by which automation renders human skills obsolete or devalued—has a long intellectual history in sociology and labor studies (Braverman, 1974). More recently, AI has reanimated these concerns. A growing interdisciplinary literature documents the “deskilling dilemma” facing professions from medicine to education (Frontiers in Medicine, 2026; Susskind & Susskind, 2021).

In translation studies, the deskilling narrative is particularly acute. Translators have long experienced technology-driven shifts, from computer-assisted translation (CAT) tools to neural machine translation (NMT) and now generative AI. However, the GenAI era intensifies this trend. Whereas earlier tools functioned as assistants that augmented human translators, GenAI tools increasingly function as substitutes capable of producing publishable translations with minimal human oversight (Wu et al., 2024). This transition has prompted widespread professional discourse about the “devaluation of translation skills” in both labor markets and educational settings (CACM,2025).

For learners, the deskilling problem takes on a distinct psychological dimension. AI & Society (2025) has framed “AI deskilling as a structural problem” that not only reduces labor market value but also produces “value derogation”—a subjective perception that acquired skills have lost their worth. This perception, we argue, is not merely an economic calculation but an affective event. When a skill one has invested effort to develop appears to be effortlessly replicated or surpassed by a machine, the subjective value of that skill may collapse, triggering disengagement, apathy, and boredom.

Crucially, this deskilling-induced devaluation is distinct from traditional sources of devaluation identified in FLB research. It is not that the translation task is inherently unchallenging or monotonous, but that the entire enterprise of learning translation is delegitimized by the machine’s demonstrated superiority. The meaning of translation education—its rationale, its purpose, its connection to future professional identity—is called into question. This is a value crisis, not a challenge crisis.

2.4 The MAC Model and the Meaning Route to Boredom

The Meaning and Attention Components (MAC) model, proposed by Westgate and Wilson (2018), offers a comprehensive cognitive account of boredom. The model posits that boredom arises when two conditions are simultaneously met: (a) a meaning deficit—the individual fails to find meaning or value in the current activity—and (b) an attention deficit—the individual has difficulty sustaining attention, typically due to a mismatch between available cognitive resources and task demands (too easy, too difficult, or too monotonous). Crucially, the two pathways are independent and additive: either pathway can produce boredom alone, but the intensity of boredom is greatest when both deficits are present.

The MAC model has been empirically supported in experimental and survey research (Westgate et al., 2017; Wolff & Martarelli, 2020), and has been applied to educational contexts including lecture settings and online learning (Mettler et al., 2021; Zhang & Liu, 2023). However, its application to second language education, and specifically to translation classrooms, is virtually nonexistent.

Why is the MAC model particularly suited to the AI-boredom question? First, it provides a clean theoretical architecture for separating the meaning pathway (value-centered) from the attention pathway (challenge-centered). This allows us to directly test whether AI-induced boredom operates primarily through meaning collapse—as we hypothesize—or whether it is better explained by challenge/skill mismatch, consistent with traditional FLB accounts. Second, the MAC model’s explicit conceptualization of meaning as a dynamic process—the perception that activity is “worthwhile, significant, or interesting” (Westgate & Wilson, 2018, p. 690)—aligns precisely with the value erosion narrative we seek to capture. Third, the model offers a unified framework for understanding boredom across both in-the-moment experiences and general classroom dispositions, making it applicable to our survey-based design.

The theoretical innovation of this study, therefore, lies in bringing together three previously disconnected lines of inquiry: (a) the engagement-dominant AI narrative, (b) FLB research’s saturation with CVT/attention explanations, and (c) the deskilling/value derogation discourse. We propose that the MAC model provides the integrative lens through which these lines can be synthesized, and that the meaning pathway—underexplored in FLB research—offers the most promising explanation for AI-induced boredom. The empirical test of this proposition is detailed in the following sections.

3. Conceptual Framework and Hypotheses

3.1 Construct Definitions

Perceived AI skill devaluation is defined as learners’ subjective perception that the value of acquiring translation skills has been diminished by generative AI’s translation capabilities. Operationally, we measure this construct through adapted task value items (Eccles & Wigfield, 2020) with AI-specific attributional framing (e.g., “Because AI can translate so well, learning translation is less useful than it used to be”).

Meaning deficits refer to learners’ experience of translation activities as lacking significance, purpose, or personal relevance—the MAC model’s meaning pathway. We measure this as a state-like perception that translation learning is “pointless,” “not worth doing,” or “doesn’t matter to me.”

Attention deficits refer to learners’ experience of challenge-skill mismatch, operationalized as perceptions that translation tasks are consistently too easy or too difficult, or otherwise fail to occupy cognitive resources.

Translation classroom boredom is conceptualized as a negative emotion characterized by low arousal and low pleasantness, arising from meaning and/or attention deficits, and experienced in the context of translation instruction.

3.2 Hypotheses

Based on the preceding theoretical reasoning, we propose the following hypotheses:

H₁: Perceived AI skill devaluation positively predicts translation classroom boredom among application-oriented EFL translation majors.

H₂: Meaning deficits mediate the relationship between perceived AI skill devaluation and translation classroom boredom.

H₃: The meaning pathway (perceived AI skill devaluation→meaning deficits→boredom) exerts stronger effects than the attention pathway (perceived AI skill devaluation→attention deficits→boredom).

H₁ tests the basic association of interest. H₂ examines the MAC model's specific mediation mechanism. H₃ constitutes our central theoretical contribution: a direct comparison of the meaning pathway against the attention pathway as explanations for AI-induced boredom.

3.3 Conceptual Model

Figure 1 presents the conceptual path model integrating these hypotheses.

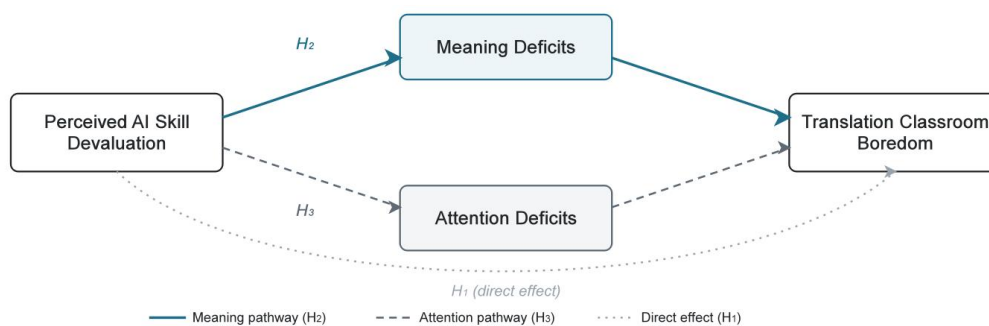


Figure 1. Conceptual Path Model

4. Methodology

4.1 Research Design

We employed an explanatory sequential mixed-methods design (Creswell & Plano Clark, 2018), consisting of a quantitative Phase 1 (survey with structural equation modeling) followed by a qualitative Phase 2 (semi-structured interviews). This design was chosen to: (a) test the hypothesized pathways with statistical rigor in a representative sample (Phase 1), and (b) gain in-depth understanding of the psychological mechanisms and subjective experiences underlying those pathways (Phase 2), thereby achieving triangulation and explanatory depth.

4.2 Participants

Phase 1 (Quantitative). Participants were 326 undergraduate students recruited from four application-oriented universities in Guangdong and Zhejiang provinces, China. These institutions were purposively selected based on their explicit “application-oriented” mission, as documented in their institutional charters and program descriptions. Students were drawn from the translation, business English, and English education tracks—all applied programs with practical skill emphases.

Inclusion criteria: (a) current enrollment in a translation course in the 2025-2026 academic year, (b) self-identified as EFL learners (English as a foreign language), and (c) had experience using generative AI tools (at least occasional use). After screening for incomplete responses and non-AI-users, the final

analytic sample comprised 302 participants (response rate:93.3%). Demographics: 72.5% female; age range 19-24 (M=21.3, SD=1.5); year of study: 28.5% sophomore, 44.7% junior, 26.8% senior. Translation course levels: introductory (41.7%), intermediate (38.1%), advanced (20.2%). AI usage frequency: daily (23.8%), weekly (52.6%), monthly (16.6%), occasionally(6.9%).

Phase 2(Qualitative). From the Phase 1 sample, we purposively selected 18 participants representing high (top 25%), medium (middle 50%), and low (bottom 25%) levels of perceived AI skill devaluation, balanced by gender and academic year. This theoretical sampling ensured maximum variation and enabled comparison across levels of the focal construct. The final qualitative subsample comprised 13 females and 5 males, ages 20-24.

4.3 Instruments

All instruments were administered in simplified Chinese. English translations of scale items are provided for reporting purposes, with back-translation verification by two independent bilingual researchers.

Perceived AI Skill Devaluation Scale (PAI-SD). We developed a 9-item measure based on the subjective task value framework (Eccles & Wigfield, 2020), with item wording modified to reflect AI attribution. Items tapped three dimensions of perceived value diminishment:

Attainment value devaluation (4 items): “Because AI translates well, I feel that my translation skills are becoming less important to my identity.”

Utility value devaluation (3 items): “AI has made translation skills less useful for my future career.”

Intrinsic value devaluation (2 items): “AI makes translation learning feel less interesting.”

Items were rated on a 7-point Likert scale (1=strongly disagree,7=strongly agree). A pilot test with 45 students (excluded from the main sample) provided preliminary evidence of internal consistency (Cronbach’s $\alpha=.89$) and factorial structure (three factors accounting for 72.3% of variance).

Translation Classroom Boredom Scale (TCBS). We adapted items from the Foreign Language Learning Boredom Scale (FLLBS; Li et al., 2023) and the translation-specific boredom items validated by Zawodniak et al. (2022). The final 8-item scale tapped frequency and intensity of boredom during translation classes (e.g., “I often feel bored in translation class”; “Time seems to drag when I’m in translation class”). Items used a 7-point frequency scale (1=never,7=always). Cronbach’s α in pilot=.91.

MAC Pathway Measures.

Meaning deficits (MAC-M): We adapted the “meaningfulness” subscale from the Boredom Proneness Scale (BPS; Vodanovich & Kass, 1990) and supplemented with items from Westgate and Wilson (2018). The 5-item scale measured perceived lack of meaning in translation activities (e.g., “Translation exercises don’t feel meaningful to me”; “I can’t see the point of doing translation practice”). Cronbach’s $\alpha=.87$.

Attention deficits (MAC-A): We measured challenge-skill mismatch using items adapted from the “boredom due to under-/over-challenge” subscales of existing FLB instruments (Li et al., 2023) and added attention-specific items (e.g., “Translation tasks are either too easy or too difficult for me”; “I

have trouble paying attention in translation class because the work doesn't engage me"). Cronbach's $\alpha=.84$.

Background Variables. We included: gender, age, year of study, translation course level, self-reported English proficiency (4-point scale: beginner to advanced), and AI usage frequency.

4.4 Procedure

Data collection occurred in January 2026, near the end of the fall semester. Ethics approval was obtained from the researchers' institutional review board. In Phase 1, trained research assistants administered paper-based surveys during class sessions, with 30 minutes allocated for completion. Informed consent was obtained prior to participation. Participants were assured of anonymity and that responses would not affect course grades.

In Phase 2, conducted two weeks after Phase 1, semi-structured interviews were conducted either in person ($n=11$) or via video conference ($n=7$) depending on participant preference, to reduce barriers. The interview protocol focused on: (a) experiences with AI in translation learning, (b) feelings about AI's translation capability, (c) experiences of boredom in translation classrooms, and (d) perceived changes in motivation and value beliefs. Interviews lasted 35-55 minutes ($M=42$ min). All interviews were audio-recorded and transcribed verbatim in Chinese.

4.5 Analysis

Quantitative Analysis. Data were analyzed using SPSS 27.0 and AMOS 24.0. Preliminary analyses included: descriptive statistics, reliability (Cronbach's α), and exploratory factor analysis (EFA) for the PAI-SD. Confirmatory factor analysis (CFA) assessed the measurement model fit using standard indices: $\chi^2/df < 3$, $CFI \geq .90$, $TLI \geq .90$, $RMSEA \leq .08$, $SRMR \leq .08$ (Hu & Bentler, 1999). Composite reliability (CR) and average variance extracted (AVE) were computed to assess construct reliability and discriminant validity (Fornell & Larcker, 1981).

Common method bias was evaluated using Harman's single-factor test (Podsakoff et al., 2003). We also employed the marker variable technique to estimate and partial out potential bias.

Structural equation modeling (SEM) was conducted to test hypotheses H_1 - H_3 . Mediation was tested via bootstrapping with 5,000 resamples (Preacher & Hayes, 2008). Pathway comparison (H_3) was conducted using the Wald test of parameter constraints in AMOS.

Qualitative Analysis. Thematic analysis followed Braun and Clarke's (2006) six-phase procedure: familiarization, initial coding, theme generation, theme review, definition, and write-up. Two researchers independently coded the Chinese transcripts, with an initial inter-coder agreement of 87%; discrepancies were resolved through discussion. Codes were subsequently translated into English and organized into themes. Themes were then mapped onto the MAC framework to identify convergence or divergence with quantitative findings.

5. Results

5.1 Descriptive Statistics and Measurement Model

Descriptives. Table 1 presents descriptive statistics, reliability coefficients, and correlations among

core constructs. Mean levels of perceived AI skill devaluation ($M=4.58$, $SD=1.32$) were slightly above the scale midpoint (4.0), indicating moderate-to-high perceptions among participants. Translation classroom boredom ($M=4.31$, $SD=1.53$) was similarly moderate. Meaning deficits ($M=4.67$, $SD=1.44$) and attention deficits ($M=4.12$, $SD=1.38$) were also near midpoint.

Table 1. Descriptive Statistics, Reliabilities, and Correlations

Variable	M	SD	α	1	2	3	4
1. PAI-SD	4.58	1.32	0.91	-0.75			
2. Meaning Deficits	4.67	1.44	0.88	.56**	-0.8		
3. Attention Deficits	4.12	1.38	0.85	.35**	.44**	-0.76	
4. TC Boredom	4.31	1.53	0.92	.51**	.62**	.48**	-0.83

Note. $N=302$. ** $p<.01$. Values in parentheses=square root of AVE (average variance extracted). PAI-SD=Perceived AI Skill Devaluation; TC=Translation Classroom.

Measurement Model. We conducted CFA on the four latent constructs (PAI-SD, meaning deficits, attention deficits, and boredom). The measurement model showed acceptable fit: $\chi^2/df=2.34$, CFI=.94, TLI=.92, RMSEA=.067 (90%CI[.059,.075]), SRMR=.058. All factor loadings exceeded .60 (range.62-.91), indicating adequate indicator reliability. Composite reliability (CR) values ranged from .85 to .93, exceeding the .70 threshold. Average variance extracted (AVE) ranged from .75 to .83, exceeding .50, supporting convergent validity. Discriminant validity was established as the square root of AVE for each construct exceeded its correlations with other constructs (Table 1).

Common Method Bias. Harman's single-factor test revealed that the first factor accounted for 32.8% of total variance, below the 50% threshold, suggesting common method bias is not a serious concern. The marker variable technique further indicated negligible bias.

5.2 Structural Model and Hypothesis Testing

The structural model with the hypothesized pathways demonstrated good model fit: $\chi^2/df=2.51$, CFI=.92, TLI=.91, RMSEA=.071 (90%CI[.063,.079]), SRMR=.061.

Direct Effect (H₁).

Perceived AI skill devaluation positively predicted translation classroom boredom ($\beta=.42$, * $p<.001$), supporting H₁. This direct effect remained significant when controlling for gender, age, and AI usage frequency.

Mediation Effect (H₂).

The indirect effect of PAI-SD on boredom through meaning deficits was significant ($\beta=.31$, * $p<.001$, 95%CI[.24,.39]). Bootstrapping with 5,000 resamples confirmed a significant indirect effect (CI[.21,.41]). The direct effect of PAI-SD on boredom was reduced from $\beta=.42$ to $\beta=.11$ (* $p=.083$) when meaning deficits were included, indicating full mediation. H₂ was supported.

Pathway Comparison (H₃).

We estimated two competing mediated pathways: (a) PAI-SD→meaning deficits→boredom, and (b) PAI-SD→attention deficits→boredom. The meaning pathway showed a standardized indirect effect of .31 (95%CI [.22,.40]), while the attention pathway showed .12 (95%CI [.06,.18]). A Wald test of parameter constraints indicated that the meaning pathway was significantly stronger than the attention pathway: $\Delta\chi^2(1)=7.84, *p=.005$. H₃ was supported. Figure 2 displays the final structural model with standardized coefficients.

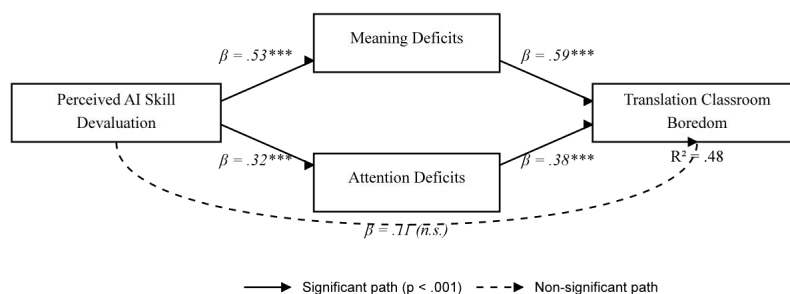


Figure 2. Structural Model with Standardized Coefficients

5.3 Qualitative Evidence

Thematic analysis of the 18 interviews corroborated and elaborated the quantitative findings. We identified three major themes, with representative quotations organized in Table 2.

Table 2. Qualitative Themes and Representative Quotations

Theme	Representative Quotations (translated)
Theme 1: AI-Induced Skill Value Collapse	“I watch DeepL produce a translation that takes me 30 minutes in 3 seconds. It’s not just faster—it’s better. It makes me wonder, why am I learning this?” (P07, high devaluation)
Theme 2: Meaning Deficit as Proximal Boredom Experience	“I’m not bored because translation is hard. I’m bored because I don’t see the point anymore. It’s like practicing writing by hand when everyone types.” (P03, high devaluation)
Theme 3: Distinction from Challenge-Based Boredom	“Sometimes I’m bored because the exercises are too easy. But that’s a different boredom—it’s like, ‘this is too trivial for me.’ The AI boredom is deeper. It’s ‘this whole thing is worthless.’” (P01, medium devaluation)

Note: Quotations selected to illustrate each theme across devaluation levels.

Theme 1: AI-Induced Skill Value Collapse captured participants’ perceptions that generative AI’s

superior translation capability had eroded the perceived worth of their developing skills. This theme was most pronounced among high-devaluation participants, but was present across all devaluation levels. The collapse narratives were often concrete and career-oriented (“will there be any jobs left”) rather than abstract.

Theme 2: Meaning Deficit as Proximal Boredom Experience directly mapped onto the MAC meaning pathway. Participants consistently distinguished their boredom as arising from a loss of purpose rather than from task characteristics. The language used—“pointless,” “waste of time,” “meaningless,” “no purpose”—paralleled the MAC model’s conceptualization of meaning as the perceived significance of activities.

Theme 3: Distinction from Challenge-Based Boredom provided qualitative evidence for H₃. Participants spontaneously distinguished AI-induced boredom from traditional boredom sources (repetition, under-challenge). The “AI boredom” was characterized as “deeper,” “existential,” and “overarching”—suggesting a qualitatively distinct affective experience rooted in meaning collapse rather than attentional failure.

Together, these qualitative findings: (a) establish the experiential reality of AI-induced value erosion, (b) confirm that meaning deficits are the proximal psychological mechanism linking devaluation to boredom, and (c) support the theoretical distinction between meaning-based and attention-based boredom in translation classrooms.

6. Discussion

6.1 Theoretical Contributions

Meaning-Deficit Boredom in the AI Era. This study introduces and empirically validates a new construct: meaning-deficit boredom in AI-era translation classrooms. Unlike traditional FLB conceptualizations that emphasize challenge-skill mismatches or task monotony, this form of boredom originates from a collapse of perceived skill value induced by generative AI’s demonstrated competence. The finding that meaning deficits fully mediated the AI devaluation-boredom relationship underscores the distinctiveness of this pathway. Learners are not simply bored because AI makes tasks easier; they are bored because AI makes the purpose of learning translation seem obsolete.

This finding aligns with recent sociological discourse on AI-driven deskilling (AI & Society, 2025; CACM, 2025) and extends it to the psychological domain. Our participants’ narratives of “why would anyone need me to do this?” echo the structural devaluation identified in labor studies but add an emotional dimension: the collapse of value is not merely a cognitive appraisal but an affective event that generates boredom as an experiential signal of meaninglessness. This emotional consequence of deskilling has been largely overlooked in prior research.

Extension of the MAC Model to EFL/Translation Contexts. Our study is the first to apply and empirically test the MAC model’s dual-pathway architecture in foreign language education. The finding that the meaning pathway outperformed the attention pathway in explaining AI-induced

boredom provides both theoretical and empirical justification for moving beyond the CVT-dominated FLB framework. While CVT remains a valuable lens for understanding boredom in general, it tends to conflate control and value appraisals, whereas the MAC model allows analytical separation of these mechanisms.

Importantly, we do not claim that the attention pathway is irrelevant to translation classroom boredom. Indeed, the attention pathway was significant, suggesting that challenge-skill mismatch still contributes to boredom in this context. However, the relative superiority of the meaning pathway in the AI-era context is a new finding with theoretical implications: as AI becomes more ubiquitous, the meaning dimension of boredom may become increasingly salient in skill-based educational domains. Future FLB research should systematically incorporate MAC's pathway distinction and pay greater attention to value/meaning dimensions.

A Boundary Condition to the Engagement-Dominant AI Narrative. Our findings provide a crucial boundary condition to the burgeoning literature celebrating AI's pedagogical benefits. While AI may enhance engagement for some learners in some contexts, for application-oriented translation majors—arguably the learners most directly threatened by AI's translation capabilities—AI may produce the opposite effect: disengagement through value erosion. This does not invalidate the engagement-dominant narrative but situates it within specific conditions: where learners perceive AI as a supplement to their developing skills rather than a substitute, the positive effects may hold. Where substitution is salient, the negative pathway documented here may dominate.

This boundary condition has implications for the broader field of educational technology research. The literature has often assumed that technology's effects are uniform across learners and contexts. Our findings suggest that technology's motivational effects are deeply contextual and contingent on learners' perceived relationship between their skills and technological capabilities—a contingency that engagement-dominant studies have systematically ignored.

6.2 Pedagogical Implications

While our study is primarily theoretical, our findings offer clear pedagogical pointers. The problem is not that translation education is inherently boring, nor that AI makes tasks easier, but that AI challenges the meaning of translation education. Pedagogical responses should therefore target meaning restoration rather than attention-redirection.

First, translation curricula should explicitly address the AI question rather than tacitly ignoring it. Students should be encouraged to articulate why human translation skills still matter—not defensively (“we’re better than machines”), but positively (“here’s what humans can do that machines cannot”). This requires reframing translation education away from “producing correct translations” and toward higher-order competencies such as cultural mediation, creative adaptation, and critical evaluation of AI outputs—skills that preserve a distinctive human value.

Second, tasks should be redesigned to make human value visible. For example, exercises that ask students to critique AI-generated translations, identify cultural nuances that AI misses, or adapt

translations for specific audiences can demonstrate the continued relevance of human judgment. Such tasks restore meaning not by denying AI's capability but by reframing human competence as complementary rather than redundant.

Third, career-relevant framing is essential for application-oriented students. Introducing discussions of how professionals use AI as a tool rather than a replacement, and inviting practitioners who have adapted to AI-mediated workflows, may help counter the "no jobs left" narrative that devalues learning. We emphasize that these pedagogical implications are pointers rather than prescriptions. They are not the focus of our study but follow logically from our findings. Future research should systematically investigate the effectiveness of such meaning-restoration interventions.

6.3 Limitations and Future Directions

This study has several limitations that shape its conclusions and point to future research.

Causal Inference. Our cross-sectional design precludes strong causal claims. While we have framed the pathway as AI devaluation → meaning deficits → boredom, the data are correlational. The MAC model posits a directional relationship, but alternative directions are plausible: boredom may lead learners to devalue translation skills ("I'm bored, so it must not be valuable"), which in turn may make AI superiority more salient. Reverse causation and reciprocal dynamics cannot be ruled out. We encourage longitudinal designs that track changes in AI perception, meaning evaluation, and boredom over time. Cross-lagged panel models could test the temporal ordering of these variables.

Generalizability. Our critical-case sampling strategy—application-oriented EFL translation majors—was chosen to maximize theoretical leverage. However, this limits generalizability. The mechanisms documented here may be weaker or operate differently among: (a) translation majors in research-oriented universities who are less employment-focused, (b) non-translation EFL learners who encounter translation as a learning tool rather than a professional skill, (c) learners in educational systems with different AI integration policies, and (d) learners who use AI differently (e.g., as an assistive tool vs. a comparison standard). Cross-cultural and cross-program comparisons would be valuable.

Measurement. The PAI-SD scale, while psychometrically sound, is novel and requires further validation across samples. The MAC pathway measures were adapted from existing instruments rather than developed specifically for the AI context, which may have limited their sensitivity. Future work should develop validated MAC-based boredom instruments tailored to technology-mediated learning environments.

Methodological Constraints. Despite Harman's test and marker variable adjustment, self-report measures carry inherent limitations including memory biases and social desirability. Observational measures of boredom (e.g., behavioral indicators, experience sampling) would supplement self-report and reduce method bias. Additionally, while our qualitative sample provided rich narratives, the interviewer's presence may have introduced social desirability effects in discussing AI and boredom.

Future Directions. Beyond addressing these limitations, we envision several productive extensions.

First, experimental designs could manipulate AI salience (e.g., exposing learners to AI translation outputs before vs. after a translation task) to test causal effects. Second, interventions aimed at restoring meaning (e.g., framing exercises as “AI assessment training” rather than “translation practice”) could test the pathway’s malleability. Third, cross-domain comparisons (translation vs. writing vs. interpreting) could identify whether meaning-deficit boredom is unique to translation or generalizable to any skill where AI demonstrates superiority.

Finally, the role of teacher mediation deserves attention. Teachers’ discourse about AI—whether they frame it as threat or opportunity—likely moderates students’ devaluation perceptions. Exploring teacher cognition, classroom discourse, and their effects on student boredom would bridge the macro-level deskilling discourse with the micro-level classroom ecology.

7. Conclusion

This study has examined a previously overlooked dark side of AI in translation education: the generation of boredom through skill value erosion. By integrating the MAC model of boredom with the AI deskilling discourse and FLB research, we have documented that perceived AI skill devaluation predicts translation classroom boredom primarily through meaning deficits, and that this meaning pathway significantly outperforms the attention (challenge-skill mismatch) pathway. The construct of meaning-deficit boredom in AI-era translation classrooms captures a distinctive experiential state—one rooted not in task monotony or difficulty, but in existential value collapse.

Our findings challenge the engagement-dominant narrative that has characterized AI research in language education, offering a critical boundary condition: for learners whose professional futures are most directly tied to the skills that AI competes for, AI’s demonstrated capability may paradoxically undermine motivation and generate negative affect. This does not warrant technological pessimism, but it does counsel against technological complacency. Translation educators, curriculum designers, and researchers must grapple with the meaning question as much as the methodological question. How will we justify the value of human translation skills in an AI-mediated world? How will we help learners find purpose when purpose is called into question?

These are not merely academic questions. They are the questions that our participants—sitting in translation classrooms, watching AI outperform them, asking “what am I training for?”—are already living. Our role as researchers is to give this lived experience theoretical language and empirical grounding, and to open pathways for pedagogical response. This study has taken a first step in that direction.

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