



The Role of Academic Locus of Control and Technology Use in Predicting EFL Learners' Language Learning Motivation: A Pilot Study

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Abstract

Academic locus of control describes whether learners attribute academic outcomes to their own effort or to forces beyond their control. It has long been associated with motivation and academic achievement in foreign language learning. At the same time, the digital resources available to language learners have expanded from established information and communication technologies (ICTs) to generative artificial intelligence (AI) applications, creating new opportunities for learning English beyond the classroom. Despite these developments, the mechanism linking learners' control beliefs to their engagement with digital technologies remains insufficiently explained. Building on a two-phase pilot study that validated the measurement instruments, this paper proposes a conceptual framework that connects academic locus of control, technology use, and language learning motivation in the English as a foreign language context. Drawing on attribution theory and learner agency, it argues that an internal orientation encourages the agentic behaviour through which learners seek out and continue using digital learning tools. Within the framework, the use of information and communication technologies and the use of artificial intelligence are conceptualized as two parallel channels through which control beliefs influence language learning motivation. The framework is presented as a set of testable directional propositions covering the direct relationship, the mediating role of each technology channel, and a cross-national boundary condition involving Hungarian and Algerian learners. The paper also explains the theoretical rationale for these propositions, relates the framework to existing research on technology in language education, and outlines the cross-sectional design planned for its empirical examination.

Keywords: locus of control, learner agency, language learning motivation, artificial intelligence, attribution theory

1 Introduction

Success in learning English as a foreign language depends on more than cognitive ability. Learners differ in how long they persist, how they respond to difficulty, and how readily they

take responsibility for their progress, and these differences often distinguish those who reach a high level of proficiency from those who do not (Heidari & Khorasaniha, 2013). Among the individual difference variables studied in this area, locus of control has occupied a central position. Rotter (1966) introduced the term to describe a generalised expectancy about the causes of outcomes, distinguishing those who believe that results follow from their own behaviour (an internal orientation) from those who believe that results are governed by luck, fate, or other people (an external orientation). In academic settings, internally oriented learners tend to show greater persistence, stronger achievement, and more deliberate use of study strategies than their externally oriented peers (Bar-Tal & Bar-Zohar, 1977; Findley & Cooper, 1983; Yazdanpanah et al., 2010).

The setting itself has shifted considerably. Today's learners draw on a wide range of digital resources: established information and communication technologies (ICT) such as online dictionaries, grammar sites, and multimedia, and, more recently, generative artificial intelligence (AI) applications such as conversational agents and writing assistants, which have only been broadly available since late 2022 (Guan et al., 2024; Jeon et al., 2023). Much of this technology use takes place outside the classroom and is initiated by learners themselves. This type of self-directed engagement with digital resources is commonly described as informal digital learning of English (IDLE), referring to language learning in digital environments that is driven by personal interest rather than teacher-directed instruction or assessment (Lee, 2022; Soyoof et al., 2021). These tools tend to be described as supports for independent study, but there is little reason to assume that every learner takes them up the same way or gets the same value out of them (Chang & Ho, 2009).

These observations suggest a potential relationship between learners' internal locus of control, their use of digital technologies, and their language learning motivation. If an internal orientation disposes learners to act on their environment, it may also encourage them to seek out and make greater use of the digital tools available to support their learning. Greater engagement with these tools may, in turn, be associated with higher levels of language learning motivation. In psychological terms, the link between a control belief and an action is a question of agency: the learner's capacity to act deliberately on the conditions of their own learning (Bandura, 2006; Mercer, 2011). Although both locus of control and technology use have been linked to language learning outcomes, they are often examined separately, leaving limited understanding of how learners' control beliefs may shape their engagement with digital learning tools. This paper addresses that gap by proposing a conceptual framework that connects academic locus of control, learner agency, technology use, and language learning motivation, expressed as a set of propositions that can guide future empirical research. The discussion begins with the theoretical background, then reviews technology use in language learning, before presenting the proposed framework and the methodological considerations for examining it empirically.

2 Research Background

This paper forms part of an ongoing doctoral research project examining the relationship between academic locus of control, technology use, and language learning motivation among EFL learners. The project began with a two-phase pilot study designed to validate the research instruments and establish an initial basis for the proposed research model before full-scale data collection (Boudraa, 2025, 2026). The first phase ($N = 21$) confirmed strong reliability for the standardized Locus of Control ($\alpha = .885$) and Motivation ($\alpha = .969$) scales and found a significant positive correlation between internal locus of control and motivation ($r = .51, p = .018$) but revealed weak reliability in the researcher-developed ICT subscale,

which was subsequently revised (Boudraa, 2025, 2026). A second phase ($N = 27$), conducted after item refinement, confirmed improved reliability for both the ICT ($\alpha = .807$) and AI ($\alpha = .824$) subscales, though the locus of control–motivation correlation in this smaller second sample did not reach significance ($r = .33$, $p = .089$) (Boudraa, 2026). These pilot findings confirmed the psychometric soundness of the revised instrument and offered preliminary, if inconclusive, support for a relationship between locus of control and motivation, while leaving the specific mediating role of ICT and AI use untested due to the limited sample sizes. It also highlighted the need for a stronger theoretical explanation of how learners' control beliefs may influence their engagement with digital technologies and, ultimately, their language learning motivation. The following sections develop this theoretical perspective by integrating attribution theory, learner agency, and technology use into a conceptual framework that guides the empirical phase of the research.

3 Theoretical Background

The framework draws on three bodies of work: locus of control, as an account of control beliefs; attribution theory, as the account of how those beliefs turn into motivational intensity; and recent scholarship on learner agency, which supplies the behavioural bridge between holding a belief and actually acting on the learning environment.

3.1 Locus of Control and Control Beliefs

Locus of control originates in Rotter's (1966) social learning theory, where it functions as an expectancy about the relationship between behaviour and reinforcement. The construct is best understood as a continuum rather than a pair of fixed types: individuals fall somewhere between a strongly internal and a strongly external orientation, reflecting a learned belief about whether their actions matter (Reich & Infurna, 2017). Internally oriented learners generally prefer situations in which skill determines the outcome, re-examine their performance after failure, and treat sustained effort as worthwhile, while externally oriented learners are more prone to attributing results to chance or to task difficulty (Bar-Tal & Bar-Zohar, 1977; Nodoushan, 2012).

In foreign language learning, this belief system shapes how learners interpret their successes and failures (Eslami-Rasekh et al., 2012). A learner who attributes a poor result to an unfair teacher or to the inherent difficulty of the language locates the cause outside the self and thereby weakens the sense that personal effort can change the outcome (Fakeye, 2011). A consistent body of work reports that internally oriented learners tend to outperform their peers and to engage more actively in the learning process (Yazdanpanah et al., 2010), though the strength of this relationship varies with context, proficiency level, and the specific language skill in question (Eslami-Rasekh et al., 2012; Nodoushan, 2012). The important point for the present purpose is not that an internal orientation guarantees achievement but that it disposes learners to treat their own action as consequential which is the starting point for the mechanism developed below.

3.2 Attribution Theory as the Motivational Mechanism

Why a belief in personal control should generate sustained motivation at all is explained most directly by attribution theory. Weiner (1985) proposed that the causes people assign to their own achievements can be described along three dimensions: locus (internal or external to the person), stability (fixed or changeable), and controllability (within or beyond the person's influence). Perceived stability shapes what a learner expects from future attempts, while locus and controllability shape the emotional response (pride, guilt, shame) that follows an

outcome. Expectation and emotion together then steer what the learner does next, including how long they persist and what they choose to do.

Attribution theory fits this framework particularly well because it shares its central dimension with locus of control while extending it to explain motivation. According to Weiner (1985), learners who attribute success to internal, controllable effort are more likely to believe that future effort will also lead to success. They also experience a sense of pride that encourages continued engagement. In contrast, learners who attribute success to luck or an easy task are less likely to develop the same expectations. Within this framework, motivation is viewed as the outcome of learners' causal reasoning rather than as a fixed personal characteristic. The emphasis is therefore on how learners interpret their experiences and use those interpretations to guide future actions. Over time, repeated experiences of effort leading to success may strengthen both learners' internal orientation and their motivation to continue learning the language.

3.3 Learner Agency in Foreign Language Learning

The two constructs above describe what learners believe about control and how those beliefs generate motivation, but neither explains the behavioural step in between; the move from a belief to actually picking up a particular digital tool. That step belongs to learner agency. In the social sciences, agency is usually defined as the Socioculturally mediated capacity to make choices and act on one's world (Ahearn, 2001); Emirbayer and Mische (1998) described it as a temporally embedded process with an Iterational element rooted in past habit, a practical-evaluative element responsive to present demands, and a Projective element oriented toward an imagined future. Bandura (2006) made a related point, describing people as contributors to their own circumstances rather than products of them, and naming intentionality, forethought, self-reactiveness, and self-reflectiveness as the properties through which agency gets exercised.

Applied linguistics has picked up these ideas to recast the language learner as an active participant rather than a passive recipient of input. Learner agency has been described as the sense of ownership learners hold over their own learning (Larsen-Freeman et al., 2021), as the source from which learning actions arise in the first place (van Lier, 2010), and as the root from which learner autonomy grows (Benson, 2007). Mercer (2011) argued that agency is best understood as a complex dynamic system in which beliefs, motivation, affect, and self-regulation interact and change over time, and Larsen-Freeman (2019) stressed that agency is relational, emergent, and situated; something achieved within a context rather than a fixed trait a learner simply carries around. Recent empirical work backs this up: the exercise of agency depends on affordances and constraints in the learning setting, with factors like instructional conditions and available time meaningfully shaping whether learners act on the opportunities in front of them (He et al., 2024).

Two points from this literature matter most for the present argument. First, agency and control beliefs are related but not the same thing: locus of control is about what learners believe causes their outcomes, while agency is about the actual exercise of the capacity to act on that belief. An internal orientation makes agentic action likely, since a learner who sees their effort as effective has a rational basis for acting on it, but the action itself remains a further step, one that still depends on what the setting makes available (Larsen-Freeman, 2019; Mercer, 2011). Second, in digitally rich learning environments, the resources agency operates on now routinely include technological tools, so exercising agency over one's own language learning increasingly means selecting, combining, and sticking with particular

digital means of study (Lee & Lee, 2019; Soyoof et al., 2021). Agency, in other words, is the direct conceptual link between control beliefs and the specific behaviour of digital tool use.

4 Technology Use in Foreign Language Learning

Not all digital resources available to language learners are the same, and this framework deliberately treats two categories separately. The first includes information and communication technologies (ICTs) such as online dictionaries, grammar and vocabulary websites, and multimedia resources including videos and podcasts. The second consists of generative artificial intelligence (AI) applications, including conversational agents and writing assistants that can generate and respond to language interactively. This distinction is important because the two categories support learning in different ways. ICT tools mostly deliver static content that the learner retrieves and applies, while AI tools draw the learner into an exchange and adapt their output to whatever the learner puts in, which places a much higher premium on self-directed, interactive engagement (Jeon et al., 2023).

4.1 Evidence on Artificial Intelligence and Information and Communication Technologies

The evidence on these two categories of digital tools is growing, although not at the same pace. Studies of generative AI in language learning have reported improvements in language proficiency and self-regulated learning, together with higher engagement and lower levels of anxiety (Guan et al., 2024; Wei, 2023). However, a meta-analysis of AI use in informal English learning found significant positive effects on proficiency and self-regulation but no significant overall effect on motivation (Guan et al., 2024). The authors partly attributed this null finding to the lack of motivation measures specifically developed for this learning context.

This null finding is particularly important for the present framework. Rather than overlooking it, the finding should be treated as a direct empirical challenge to the proposition that AI use is positively associated with language learning motivation. For this reason, the propositions developed in this paper are presented as directional predictions that require empirical testing rather than as established conclusions. At the same time, the null finding suggests that the relationship between AI use and motivation may not be the same for all learners. Instead, it may depend on learner characteristics, such as control beliefs, that cannot be captured by an aggregate meta-analytic effect.

Research on information and communication technologies (ICTs) points to a similar conclusion. The educational value of a digital tool is not fixed but depends on how learners use it. Learners who exercise greater control over their own learning are more likely to benefit from technologies that allow them to direct and manage their learning activities (Chang & Ho, 2009).

4.2 Autonomy, Self-Regulation, and the Learner's Role

A consistent finding across recent research is that the benefits learners gain from digital tools depend largely on how they engage with them. Informal digital learning of English (IDLE) is built on this principle of self-direction. Learners choose their own resources, set their own goals, and manage their own pace of learning (Lee & Lee, 2019; Soyoof et al., 2021). This form of engagement has been associated with autonomy, self-regulation, and a stronger sense of control over the learning process (Lee, 2021). Reviews of the IDLE literature have also identified these learner-related characteristics as key antecedents and outcomes of informal digital learning (Soyoof et al., 2021). Research on generative AI suggests a similar pattern.

AI applications can provide more conversational and psychologically safer environments for language practice, encouraging learners to take risks and explore language independently in ways that were less accessible with earlier technologies (Guan et al., 2024).

These findings have two important implications for the framework developed in this paper. First, the value learners gain from digital tools depends on active and sustained engagement. As a result, a learner's disposition toward agency is likely to influence both the extent to which they use digital tools and whether they continue using them over time. This provides the conceptual link between the technology literature and control beliefs. Second, ICTs and AI support learning in different ways. Because AI requires more interactive and self-directed engagement than ICTs, there is little reason to expect control beliefs to relate to the two categories in exactly the same way or to the same degree. Together, these arguments support a framework in which locus of control influences motivation through the agentic use of digital tools, with ICT use and AI use modelled as two separate pathways rather than as a single, undifferentiated technology use variable

5 Conceptual Framework and Propositions

The proposed framework brings together the ideas discussed in the previous sections. It argues that academic locus of control relates to language learning motivation both directly and indirectly through the learner's agentic use of digital tools. Within this indirect relationship, ICT use and AI use are conceptualized as two parallel channels. Learner agency, as developed in the theoretical background, provides the explanatory mechanism underlying this indirect relationship.

The empirical model treats academic locus of control as the predictor, ICT use and AI use as two directly measured mediators, and language learning motivation as the outcome. Learner agency provides the theoretical reason for expecting locus of control to be associated with the two technology-use variables, but it is not measured directly or entered into the statistical model. Because the empirical phase uses cross-sectional data, the proposed indirect paths are interpreted as conditional associations rather than evidence of temporal or causal mediation. The framework also incorporates a cross-national boundary condition, examined through a comparison of the two educational systems included in the empirical phase of the project. Figure 1 presents the full structure of the model, and the propositions below are grouped to follow it.

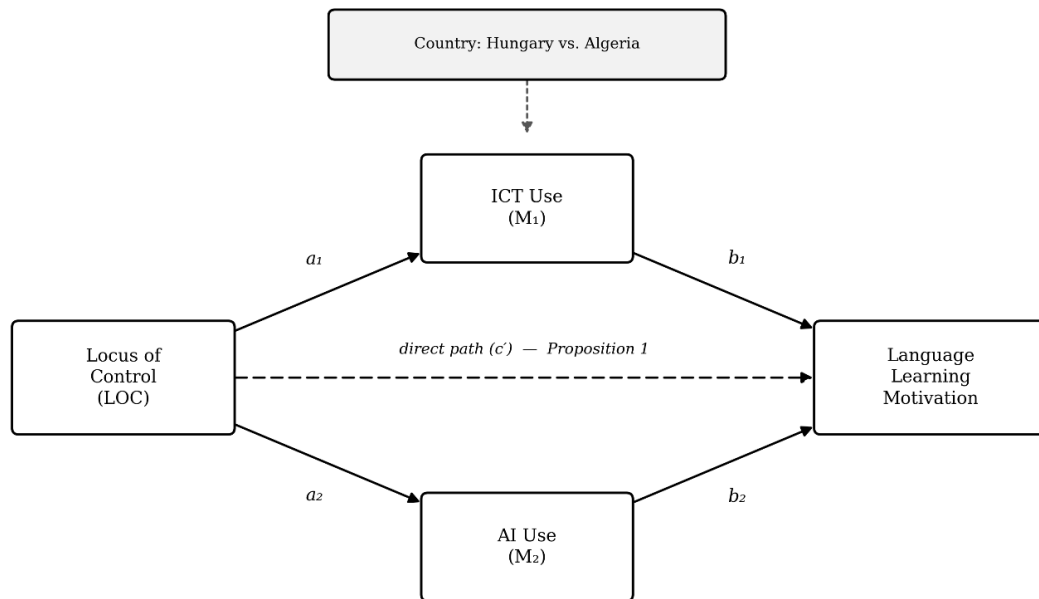


Figure 1. Proposed parallel-mediation model linking academic locus of control, technology use, and language learning motivation, with country as the cross-national moderator

5.1 The Direct Relationship

Proposition 1. Academic locus of control is positively related to language learning motivation, such that a more internal orientation goes with higher motivational intensity. This direct path restates what the locus of control literature already reports (Yazdanpanah et al., 2010), and it is grounded theoretically in attribution theory's account of how effort-contingent attribution sustains motivational investment (Weiner, 1985).

5.2 Technology Use as a Mediating Mechanism

Proposition 2. A more internal locus of control is positively associated with technology use (both ICT use and AI use), and technology engagement statistically accounts for part of the association between locus of control and motivation.

Learner agency provides the theoretical explanation for the first part of this proposition. Learners who believe that their own effort influences learning outcomes are more likely to exercise agency over their learning. In digital learning environments, this is reflected in seeking out, selecting, and continuing to use the available learning tools (Bandura, 2006; Mercer, 2011; Lee & Lee, 2019). Thus, learner agency explains why locus of control is expected to predict technology use.

In the empirical model, locus of control is treated as the predictor, while ICT use and AI use are modelled as two directly measured mediators. The parallel-mediation analysis estimates whether the association between locus of control and language learning motivation is statistically accounted for by each technology-use channel. Because the Technology Use Scale measures ICT use and AI use through separate subscales, Proposition 2 concerns the combined indirect association without assuming that the two subscales contribute equally. These estimates will not be interpreted as causal effects because temporal order cannot be established from cross-sectional observations.

5.3 Comparative Channel Strength and a Cross-National Comparison

Proposition 3. The specific indirect association estimated through AI use is significantly stronger than the specific indirect association estimated through ICT use.

ICT tools mostly offer static, access-based affordances that require learners to sustain motivational momentum with limited responsive support from the tool itself (Chapelle, 2001). Generative AI tools, by contrast, provide interactive, responsive, and performance-contingent feedback. This difference provides a theoretical basis for expecting a stronger indirect association through AI use, although the proposed contrast remains an empirical question rather than a causal claim (Guan et al., 2024; Jeon et al., 2023).

Proposition 4. The direct relationship between locus of control and motivation, together with its indirect pathways through ICT use and AI use, differs significantly between Hungarian and Algerian learners.

Educational systems vary in the extent to which they place responsibility for academic outcomes on individual learners, teachers, or institutions. They also differ in the opportunities learners have to access and use digital study tools independently outside the classroom. Either of these differences could influence how strongly control beliefs are translated into technology-mediated motivation. To the author's knowledge, this type of cross-national comparison has not been incorporated into previous research linking locus of control with digitally mediated language learning. Proposition 4 therefore represents an open empirical question rather than a straightforward extension of Propositions 1-3.

6 Research Methodology

The framework set out above is the theoretical foundation for an ongoing doctoral research project; this section describes the design, instruments, and analysis plan established for the project's forthcoming empirical testing phase.

6.1 Research Design and Participants

The project is designed as a quantitative, correlational, cross-sectional study targeting university-level EFL learners. Data collection is planned through collaboration with English language departments at Hungarian and Algerian universities, using convenience sampling, with a target sample of $N = 250$ participants. This cross-national composition provides the basis for testing Proposition 4.

The cross-sectional design is suitable for testing the proposed pattern of associations, but it cannot establish temporal precedence among locus of control, technology use, and motivation. The mediation estimates will therefore be reported as associative indirect effects. A stronger future test would use a time-lagged design in which locus of control is measured first, technology use is assessed at a later point, and motivation is measured subsequently. A longitudinal panel design with repeated measures would also allow reciprocal relationships and change over time to be examined.

6.2 Measurement Instruments

Three validated or pilot-tested instruments have been selected for the study.

Trice's Academic Locus of Control Scale (1985) will measure the independent variable. The instrument consists of 28 true/false items developed for higher education settings. It assesses whether students attribute academic outcomes to their own effort and strategy (an internal orientation) or to external factors such as examiner behaviour, task difficulty, or luck.

The Technology Use Scale is a researcher-developed instrument that distinguishes between the two categories of digital tools described earlier. Following two rounds of pilot testing and corrected item-total correlation analysis, the final version contains 13 frequency items rated from 1 (never) to 5 (always). The six-item ICT subscale includes, for example, the use of online educational platforms, communication tools, digital flashcards, online language-learning communities, English-learning websites or blogs, and grammar or writing-practice websites. The seven-item AI subscale includes AI chatbots and virtual assistants, AI-based writing-evaluation systems, AI-driven translation tools, adaptive AI learning platforms, AI content generators or summarizers, AI pronunciation or speech-feedback tools, and AI tools used to generate personalised study plans or learning materials. These examples clarify that the ICT subscale captures established digital resources and communication environments, whereas the AI subscale captures tools that generate, adapt, evaluate, or respond to learner input.

Because digital tools evolve quickly, named applications are treated as examples rather than fixed components of the construct. The functional categories represented by the items will be reviewed before future administrations, and the scale may require periodic updating as established tools add AI functions and new applications enter common use.

The Language Motivation Questionnaire measures the dependent variable. It uses a 36-item Likert scale based on Laine (1988) model, adapted by Salimi (2000), and presented in the framework described by Rahimi et al. (2008). The same instrument was later used by Hajmohammadi and Aghayani (2022) in research on EFL learners' motivation and locus of control. It was retained because it measures the intensity of language-learning motivation and preserves continuity with the pilot phases and the earlier locus-of-control literature. The more recent L2 Motivational Self System offers a valuable alternative account of future self-guides, but replacing the measure after pilot validation would alter the construct and reduce comparability across phases. Evidence from the main sample will therefore be reported for internal consistency and construct validity, and the use of this older measure will be acknowledged as a limitation.

6.3 Cross-National Measurement Procedures

The questionnaire is administered in English because the target population consists of university-level EFL learners enrolled in English-related programmes. No translated version is used; consequently, translation and back-translation are not required for the present administration. During pilot testing, participants were invited to identify items that were difficult to understand, and the technology-use items were revised on the basis of this feedback. Before comparing country-specific structural paths, the equivalence of the measures across the Hungarian and Algerian groups will be examined through multigroup confirmatory factor analysis. Configural, metric, and scalar invariance will be evaluated in sequence. If full invariance is not supported, partial invariance will be considered and cross-national mean or path comparisons will be interpreted cautiously.

6.4 Data Collection, Common Method Bias, and Ethics

Data will be collected through an online questionnaire administered using Google Forms and distributed through university channels. Participation will be voluntary, and no directly identifying information will be requested. The questionnaire instructions will explain that there are no correct or incorrect answers and will encourage participants to respond on the basis of their own learning practices.

All focal variables are measured through a single self-report questionnaire, so common method bias is a possible limitation. Procedural remedies include anonymous participation, neutral wording, separation of the scale sections, and the use of different response formats for the locus-of-control and Likert-type measures. Statistical assessment will include a single-factor confirmatory model and comparison with the proposed multidimensional measurement model. A latent common-method factor will also be examined where model identification permits. Because no theoretically unrelated marker variable was included in the completed questionnaire, a marker-variable test cannot be performed; this limitation will be stated explicitly.

The empirical phase of this doctoral research received ethical approval from the Research Ethics Committee of the University of Pécs (Approval No. 6/2025. (VI. 19.)). Participation in the study is entirely voluntary. Before accessing the questionnaire, participants are informed about the purpose of the research, the anonymous and confidential handling of their responses, and the voluntary nature of their participation. Electronic informed consent is obtained through the first question of the questionnaire, in which participants indicate whether they agree to participate before proceeding to the survey. The questionnaire is designed so that participants may discontinue it at any stage before submission simply by leaving the survey. All responses are collected anonymously, stored securely, and reported only in aggregated form in accordance with institutional ethical guidelines and applicable data protection regulations.

6.5 Statistical Analysis, Power, Sampling Balance, and Covariates

Statistical analyses will be conducted using IBM SPSS Statistics 26 and PROCESS. Pearson correlation will be used to examine the direct association proposed in Proposition 1. PROCESS Model 4, with ICT use and AI use entered as parallel mediators, will estimate the total and specific indirect associations and the contrast between the two channels for Propositions 2 and 3. PROCESS Model 59 will be used to examine whether country moderates the paths, b paths, and the direct path proposed in Proposition 4 (Hayes, 2022). Bias-corrected bootstrap confidence intervals based on 5,000 resamples will be reported. All mediation terminology will be interpreted associatively because the design is cross-sectional.

An a priori power assessment will be conducted using Monte Carlo simulation for the parallel and moderated mediation model (Schoemann et al., (2017)). Anticipated path coefficients will be based on the pilot estimates and conservative small-to-moderate effects from related research. The simulation will use at least 10,000 replications and a two-sided alpha level of .05, with a minimum target of .80 power for the focal indirect and interaction effects. The planned sample of approximately 250 participants will be retained only if the simulation indicates adequate power; otherwise, recruitment will continue where feasible.

Recruitment will be monitored by country to limit substantial imbalance between the Hungarian and Algerian groups. Group-specific sample sizes and demographic distributions will be reported. If unequal group sizes remain, the analyses will use bootstrap confidence intervals and heteroscedasticity-consistent standard errors, and sensitivity analyses will be conducted to determine whether conclusions change when the larger group is reduced through random subsampling. Strong cross-national conclusions will be avoided when one group is too small to support stable conditional estimates.

The planned covariates are sex, age group, academic programme/level, and self-reported English proficiency, because these variables may be related to motivation or patterns of technology use. Country is treated as the moderator rather than as a covariate. Prior academic achievement and independent measures of technology access are not included among the

planned measures and therefore will not be entered into the model. Their absence will be acknowledged as a limitation rather than addressed through proxy variables.

Table 1. Statistical analysis plan

Analysis Phase	Empirical Objective	Statistical Tool
Preliminary analyses	Descriptive statistics; skewness and kurtosis; Cronbach's alpha for all scales	SPSS
Direct relationship (Proposition 1)	LOC-Motivation direct relationship	Pearson correlation
Parallel mediation with contrast (Propositions 2–3)	ICT use and AI use as parallel mediators; total, specific, and indirect effects	PROCESS Model 4, two parallel mediators, contrast = 1
Cross-national moderation (Proposition 4)	Whether the a-paths, b-paths, and direct path differ between Hungarian and Algerian subsamples	PROCESS Model 59, W = Country

7 Conclusion

This paper has proposed a conceptual framework linking academic locus of control, technology use, and language learning motivation in the foreign language context. Within the framework, learner agency provides a theoretical explanation for why control beliefs may be associated with technology use, rather than serving as a separate measured variable. Drawing on attribution theory and learner agency, the framework proposes that an internal orientation is associated with learners' willingness to view their own actions as consequential and to engage actively with digital learning tools. ICT use and AI use are modelled as parallel statistical pathways, with the AI pathway expected to show a stronger indirect association because of its more responsive and interactive affordances. The framework also includes a cross-national boundary condition, recognizing that the pattern of associations may differ between the Hungarian and Algerian educational contexts.

The contribution of this paper is primarily theoretical rather than empirical. It offers a structured account of how internal control beliefs, agentic technology use, and language learning motivation may be related, and it introduces a cross-national boundary condition at the model-development stage. The proposed framework now requires empirical testing. Cross-sectional parallel-mediation and moderated-mediation analyses can establish whether the observed pattern is consistent with the propositions, but they cannot establish temporal sequence or causality. Longitudinal, time-lagged, or experimental research will be needed to determine whether control beliefs precede technology engagement and whether changes in technology use are followed by changes in motivation.

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