

Toward Inclusive Artificial Intelligence Literacy in Language Teacher Education: A Conceptual Framework for Linguistic Accessibility

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Received: June 5, 2026 Accepted: September 3, 2026 Published: October 23, 2026

doi:10.5296/elr.v12i2.24111 URL: <https://doi.org/10.5296/elr.v12i2.24111>

Abstract

Generative artificial intelligence has rapidly become consequential for language education, yet its benefits are not distributed equally across the diverse population of language learners, which includes disabled learners and multilingual learners affected by structural inequality. The central argument is that teacher competence for generative AI in language education should be reframed from technical fluency toward the design of accessible linguistic participation. Existing frameworks for teachers and AI, including teacher digital competence models, AI-extended technological pedagogical content knowledge, and AI-literacy frameworks, are well developed but border rather than enter a critical intersection: none places linguistic accessibility at its center or treats disability and linguistic diversity as constitutive concerns. Using a structured conceptual synthesis with transparent source identification and tests of differentiation and application, this study constructs the Inclusive AI Literacy for Linguistic Accessibility framework for language teacher education. The framework positions the teacher as a reflective designer of accessible linguistic participation and articulates four interdependent dimensions: Critical-Functional AI Knowledge, Accessibility-Oriented Pedagogical Design, Inclusive Linguistic Mediation, and Ethical-Equity Stewardship. Two cross-cutting commitments distinguish the framework from existing models: the social model of disability and linguistic justice, which guard against deficit and assimilationist logics. The framework is differentiated from competing teacher-AI frameworks, illustrated through a worked teacher-education case, and translated into learning objectives. Throughout, competence is treated as a matter of design rather than technical fluency. The article engages objections of de-skilling, surveillance, and standardization, and sets out an agenda for participatory and empirical validation.

Keywords: artificial intelligence literacy, language teacher education, linguistic accessibility, universal design for learning, generative artificial intelligence, translanguaging, critical disability studies, inclusive education

1. Introduction

The rapid diffusion of generative artificial intelligence (GenAI) into language education has reframed long-standing questions about who has access to language, to literacy, and to full participation in linguistically mediated life. Within two years of the public release of large language model (LLM) chat interfaces, empirical research on GenAI in language learning and teaching expanded from a handful of exploratory studies into a substantial corpus, with systematic syntheses already documenting effects on writing, speaking, feedback, and engagement (Li, Tan, et al., 2025). Meta-analytic evidence suggests that conversational AI can support gains in second language acquisition (Li, Wang, & Yang, 2025) and that chatbot-mediated practice improves a range of outcomes relative to conventional instruction (Lyu, Lai, & Guo, 2025). These developments have been accompanied by professional enthusiasm and anxiety among language teachers, whose perceptions oscillate between treating GenAI as an unprecedented ally and as a threat to integrity and to the formative value of effortful learning (Derakhshan & Ghiasvand, 2024).

A quieter but more consequential question has received comparatively little attention: for whom is GenAI making language accessible, and on what terms? The dominant narrative of efficiency and personalization assumes an idealized learner who can type fluently, see a screen, hear synthesized speech, parse complex prompts, and exercise the autonomy required to evaluate machine-generated language. Yet learners vary profoundly along dimensions of (dis)ability, language repertoire, and access to infrastructure. When GenAI enters language classrooms without explicit attention to this variability, it risks reproducing, and amplifying, the exclusions that already structure language education. Critical scholarship on natural language processing shows that language technologies redistribute power and frequently disadvantage speakers of non-dominant varieties (Blodgett et al., 2020), that bias is propagated through data and design (Mehrabian et al., 2021), and that algorithmic harm falls most heavily on those already marginalized (Birhane, 2021). Accessibility, then, cannot be an automatic by-product of technological sophistication; it must be designed, and the central agent of that design is the language teacher.

1.1 An Over-Supplied Yet Ill-Fitted Field

The claim that language teachers need preparation for GenAI is not itself novel, and it would be inaccurate to suggest that no frameworks address teachers and AI. On the contrary, the field is increasingly well supplied. The European Framework for the Digital Competence of Educators (Redecker, 2017) provides a comprehensive model of teacher digital competence; technological pedagogical content knowledge has been explicitly extended to generative AI (Mishra, Warr, & Islam, 2023) and reformulated as Intelligent-TPACK to capture the ethical integration of AI tools (Celik, 2023); and supranational bodies have issued competency frameworks for teachers in the age of AI (UNESCO, 2024). Alongside these, general AI-literacy frameworks specify what it means to understand and critically use AI (Long & Magerko, 2020; Ng et al., 2021), and validated instruments now measure teachers' and learners' AI literacy (Chiu et al., 2024; Ng et al., 2024).

The problem this article addresses is therefore not an empty space but an ill-fitted one. None of

these frameworks centers linguistic accessibility or engages disability as anything other than a peripheral concern, and none is theorized for the specificity of language as the simultaneous medium, object, and outcome of instruction. DigCompEdu (Redecker, 2017) treats inclusion as one area among many, without reference to GenAI or to the linguistic particularity of language teaching. TPACK in the age of GenAI (Mishra, Warr, & Islam, 2023) and Intelligent-TPACK (Celik, 2023) foreground ethical and pedagogical integration but say little about disabled learners or about the redistribution of linguistic participation. AI-literacy frameworks remain general-purpose and, by the admission of their own critical successors, under-theorize equity for disabled users (Veldhuis et al., 2025). The gap, in other words, is not the absence of frameworks for teachers and AI but the absence of a framework that places linguistic accessibility and inclusion at the orienting center and is built for language teacher education specifically. Establishing this differentiation, rather than asserting a vacuum, is the first task of the present article.

1.2 Reframing the Stakes: Disability, Justice, and Access

Two theoretical commitments distinguish the framework proposed here and guard it against the deficit thinking that often accompanies discussions of accessibility technology. The first derives from critical disability studies. Following the social model of disability, barriers to participation are located not in impaired bodies but in environments, curricula, and technologies designed without disabled people in mind (Oliver, 2013; Shakespeare, 2014; Goodley, 2014). On this view, GenAI is not a remedy applied to deficient learners but a designed environment that can either dismantle or erect barriers, and the imperative “nothing about us without us” (Charlton, 1998) demands that disabled learners and teachers be treated as agents rather than as objects of intervention, a demand increasingly taken up in the design of accessible technologies (Spiel et al., 2020). The framework consequently treats accessibility as a property of pedagogical design and of ableist or anti-ableist assumptions (Campbell, 2009), not as a catalogue of impairments to be remediated.

The second commitment derives from the sociolinguistics of justice. Linguistic accessibility cannot mean assimilation to a single standardized norm, because the dominance of standardized varieties in language models is itself a vector of inequity (Blodgett et al., 2020), and because raciolinguistic ideologies routinely position racialized and multilingual speakers as deficient regardless of their actual practice (Flores & Rosa, 2015; Rosa & Flores, 2017). A framework oriented toward access must therefore be reconciled with translanguaging and plurilingual perspectives that treat learners’ full linguistic repertoires as resources rather than as interference (García & Wei, 2014; Otheguy, García, & Reid, 2015; Canagarajah, 2013; Cenoz & Gorter, 2021), and with a commitment to linguistic diversity as a matter of social justice (Piller, 2016). These commitments are not decorative; they generate a productive tension, examined throughout the article, between making language more accessible and avoiding the flattening of linguistic diversity into a dominant norm.

1.3 Purpose, Research Questions, and Contribution

At its core, this article advances a single claim: preparing language teachers for generative AI should be understood not as building technical fluency with tools but as cultivating the capacity

to design accessible linguistic participation, and it is this reframing—rather than any new atomic competence—that constitutes the framework’s central contribution. This article constructs and articulates a conceptual framework for inclusive AI literacy in language teacher education, oriented toward linguistic accessibility and grounded in critical disability studies and the sociolinguistics of justice. The work is theoretical and methodological: it synthesizes scholarship through a transparent procedure, differentiates the resulting framework from existing teacher-AI models, operationalizes a small set of interlocking dimensions with explicit boundaries, and tests the framework against a worked illustrative case rather than validating it circularly against its own sources.

Three research questions guide the article. First, what do existing AI-literacy, teacher digital competence, and AI-TPACK frameworks fail to capture when examined through the lens of linguistic accessibility for diverse language learners? Second, what dimensions of teacher knowledge, disposition, and pedagogical reasoning are necessary to mobilize GenAI for inclusive language education without reproducing deficit or assimilationist logics? Third, how can these dimensions be organized into a coherent, demonstrably non-redundant, and usable framework, and what does its application look like in practice?

The contribution is threefold. Conceptually, the article specifies and theorizes an intersection that existing frameworks leave at their margins, integrating AI literacy, Universal Design for Learning, and TPACK with critical disability studies and linguistic justice. Practically, it translates the synthesis into design principles, learning objectives, and an illustrative application that teacher educators can use. Critically, it holds throughout that accessibility and equity are constitutive commitments rather than optional refinements, while remaining candid about the limits of a conceptual proposal. In an era in which GenAI is becoming infrastructural to language teaching, the question of who is included, on whose terms, and by whose design is among the field’s most pressing.

2. Theoretical Foundations

The framework advanced here draws on five bodies of scholarship: artificial intelligence literacy, the established frameworks of teacher technology and AI competence, Universal Design for Learning together with the engineering of linguistic accessibility, critical disability studies, and the sociolinguistics of justice. This section reviews each, clarifying what it offers and where it stops, so that the framework can be positioned as a non-redundant integration rather than a relabeling.

2.1 From AI Literacy to Critical AI Literacy

The contemporary concept of AI literacy was consolidated by Long and Magerko (2020), who defined it as a set of competencies enabling individuals to critically evaluate AI, communicate and collaborate with it, and use it as a tool. Ng et al. (2021) synthesized the field into four aspects: knowing and understanding, using and applying, evaluating and creating, and engaging with ethics. Subsequent work moved from defining to measuring AI literacy, producing validated instruments (Ng et al., 2024; Chiu et al., 2024) and curricular models for diverse populations (Kong, Cheung, & Zhang, 2021; Southworth et al., 2023), with reviews

mapping the field's rapid but uneven growth (Casal-Otero et al., 2023; Laupichler et al., 2022). Two limits matter here. These frameworks are general-purpose, not theorized for language as the object of instruction, and they foreground ethics in the abstract while saying little about disability or the structural distribution of harm. The articulation of a critical AI literacy (Veldhuis et al., 2025) begins to address the second limit by foregrounding power and justice, insisting that understanding how AI works must be joined to understanding whom it serves; it does not, however, address the first. For the language teacher specifically, these generic competencies acquire a distinct object: to evaluate an AI system is to judge not only whether its output is accurate but whether the language it generates is faithful to the target variety, register, and the learner's developing repertoire, rather than defaulting to a standardized norm. AI literacy for language teacher education is therefore not the generic capacity applied in a language classroom but that capacity reorganized around language as the very thing the machine produces and the learner is trying to acquire.

2.2 Existing Teacher Technology and AI Frameworks: The Precise Gap

Language teacher education is not without frameworks for technology and AI, and the present proposal must be differentiated from them rather than presented as filling a vacuum. Technological pedagogical content knowledge (Mishra & Koehler, 2006; Koehler, Mishra, & Cain, 2013) remains the dominant model of the specialized knowledge teachers need to integrate technology into content-specific instruction, and it has been actively updated for the present moment: Mishra, Warr, and Islam (2023) reconsider TPACK in the age of ChatGPT and generative AI, and Celik (2023) proposes Intelligent-TPACK to capture the professional knowledge required to integrate AI tools ethically. At the level of generic competence, the European Framework for the Digital Competence of Educators (Redecker, 2017) specifies twenty-two competences across six areas, and UNESCO (2024) has issued an AI competency framework for teachers. Studies continue to examine how EFL teachers enact TPACK in skill-specific instruction (Abubakir & Alshaboul, 2023) and how broader teacher digital competence develops (Falloon, 2020), and intervention research and reviews show that teachers' professional GenAI competence is teachable and an active concern of the field (Moorhouse et al., 2024; Tan, Cheng, & Ling, 2025), even as teachers' readiness for AI remains uneven (Wang et al., 2023) and prevailing accounts of classroom AI literacy emphasize prompt engineering and critical thinking (Walter, 2024).

These frameworks are valuable and, in important respects, more developed than what follows in their treatment of generic competence. Their limitation is specific and consequential. None centers linguistic accessibility, and none treats disability as more than a peripheral inclusion theme. TPACK and its AI extensions theorize the integration of technology with content and pedagogy but were not built to interrogate who is excluded when the content is language itself and the technology generates language; Intelligent-TPACK foregrounds ethics but not accessibility or the linguistic specificity of exclusion (Celik, 2023; Mishra, Warr, & Islam, 2023). DigCompEdu locates inclusion in a single competence area, without reference to GenAI or to the particularity of language teaching (Redecker, 2017). The UNESCO (2024) framework addresses teachers globally but not the intersection of disability, multilingualism, and language pedagogy. The gap the present framework occupies is thus precise: it is the space where AI

competence meets linguistic accessibility for the full diversity of language learners, a space these frameworks border but do not enter. TPACK supplies the present framework with one enduring insight, that integration is irreducibly content-specific, while the accessibility and justice commitments it lacks are supplied by the traditions reviewed below.

2.3 Universal Design for Learning, Accessibility, and Comprehensibility

If AI literacy supplies a vocabulary for machine intelligence, Universal Design for Learning supplies an architecture for accessible design. UDL begins from the premise that barriers reside in inflexible curricula rather than in learners, and that variability is the norm; it organizes design around multiple means of engagement, representation, and action and expression (CAST, 2018). Meta-analytic and systematic reviews offer encouraging if still maturing evidence (Capp, 2017; Almeqdad et al., 2023), and recent scholarship repositions UDL around equity and design justice rather than compliance (Rao et al., 2023), with reviews showing that digital tools can operationalize its flexibility (Bray et al., 2024). Surrounding UDL, accessibility standards such as the Web Content Accessibility Guidelines (World Wide Web Consortium, 2018) codify perceivable, operable, understandable, and robust criteria that any digital resource should meet, though compliance remains inconsistent (Ara, Sik-Lanyi, & Kelemen, 2024; Lomellini et al., 2025). A distinct strand concerns comprehensibility itself: the field of Easy Language and Plain Language theorizes the controlled reduction of linguistic complexity for cognitive accessibility while attending to the risk of stigmatization (Maaß, 2020). UDL and accessibility standards tell teachers to provide flexible, perceivable options; they do not specify how to reason about generative tools whose outputs are probabilistic and potentially biased, nor how to reconcile simplification with linguistic diversity.

2.4 Disability Beyond Deficit: The Social Model and Critical Disability Studies

A framework centering accessibility must be built on an adequate theory of disability, and the default catalogue-of-impairments approach is inadequate. Critical disability studies reframes disability through the social model, locating barriers in disabling environments rather than in individual bodies (Oliver, 2013; Shakespeare, 2014), and through the analysis of ableism as the often-invisible norm of able-bodied functioning against which difference is measured (Campbell, 2009; Goodley, 2014). For the design of technology this reframing has a direct corollary, captured in the disability-rights principle “nothing about us without us” (Charlton, 1998): accessible systems should be designed with disabled people rather than for them, a commitment that critical disability studies has brought into human-computer interaction and the design of assistive technologies (Spiel et al., 2020). The implication for the present framework is that GenAI is not a remedy applied to deficient learners but a designed environment that can enact or dismantle ableist assumptions, and that disabled learners and teachers are agents whose participation in design is itself a criterion of accessibility. This commitment distinguishes the framework from accounts that treat assistive technology as a fix for individual deficits and reframes accessibility as the responsibility of design. Reviews of AI and emerging technologies for inclusive education confirm both the breadth of available supports and persistent gaps for particular populations (Salas-Pilco, Xiao, & Oshima, 2022; Chalkiadakis et al., 2024).

2.5 Defining Linguistic Accessibility: Translanguaging and Linguistic Justice

The orienting construct of this article, linguistic accessibility, requires definition, because an unexamined version of it can do harm. Naively, linguistic accessibility might mean making language simpler and more standardized so that more learners can access it. But the dominance of standardized varieties in language models is itself a source of inequity (Blodgett et al., 2020), and raciolinguistic ideologies position racialized multilingual speakers as deficient irrespective of their actual practice (Flores & Rosa, 2015; Rosa & Flores, 2017). A version of accessibility that flattens learners' repertoires into a single dominant norm would therefore reproduce the very injustice it claims to remedy. This article consequently defines linguistic accessibility as the design of conditions under which learners can participate fully in linguistically mediated activity using their whole semiotic and linguistic repertoires, rather than the reduction of language to a standardized form. The definition is grounded in translanguaging and plurilingual scholarship, which treats learners' repertoires as integrated resources rather than as separate, hierarchically ranked named languages (García & Wei, 2014; Otheguy, García, & Reid, 2015; Canagarajah, 2013), in pedagogical translanguaging as a deliberate classroom practice (Cenoz & Gorter, 2021), in the European tradition of plurilingual and pluricultural competence (Coste, Moore, & Zarate, 2009), and in the broader claim that linguistic diversity is a matter of social justice (Piller, 2016). So defined, linguistic accessibility is not the opposite of complexity but the removal of barriers to participation, including the barrier of monolingual, standardizing assumptions; it must be held in tension with the legitimate use of Easy and Plain Language for cognitive access (Maaß, 2020), a tension the framework makes explicit rather than resolves by fiat.

2.6 GenAI in Language Education: Affordances, Contradictions, and De-Skilling

The proximate context is the empirical literature on GenAI in language education. Applications proliferate across the curriculum: writing development (Boudouaia, Mouas, & Kouider, 2024), teacher feedback (Guo & Wang, 2024), and speaking practice that enhances willingness to communicate (Fathi, Rahimi, & Derakhshan, 2024), with practitioner analyses mapping diverse uses (Kohnke, Moorhouse, & Zou, 2023) and syntheses reporting generally positive but heterogeneous effects (Li, Tan, et al., 2025; Lyu, Lai, & Guo, 2025). This promise is shadowed by contradictions. Warschauer et al. (2023) characterize the affordances of AI-generated text for second language writers as double-edged, since the tool that scaffolds expression can also substitute for it. Beyond language specifically, research on automation bias documents a robust human tendency to over-rely on automated outputs and to under-verify them (Goddard, Roudsari, & Wyatt, 2012; Lyell & Coiera, 2017), and recent evidence warns of metacognitive laziness when learners offload thinking to GenAI (Fan et al., 2025). These risks are unequally distributed across learners and intersect with a critical literature on the datafication and surveillance of education that cautions against uncritical technological adoption (Selwyn, 2015, 2019; Williamson, 2017; Williamson, Eynon, & Potter, 2020). The pedagogical challenge is therefore not whether to use GenAI but how to design its use so that it lowers barriers without lowering expectations, fostering dependency, or extending surveillance, a judgment that requires precisely the integrated capability the next section specifies.

3. Method

This is a work of conceptual framework development. Its aim is not to estimate effects but to construct, transparently and defensibly, an integrative model that addresses a gap no existing framework resolves. Conceptual development is a recognized mode of contribution, appropriate when a field has accumulated rich but fragmented knowledge. To avoid the circularity that weakens many conceptual papers, in which a framework derived from a body of literature is then declared valid by appeal to the same literature, this section makes the procedure explicit and specifies how the framework is tested rather than merely asserted.

3.1 Approach and Its Limits

The framework was developed through structured conceptual synthesis. The label is deliberate: this is neither a systematic review, which would warrant a registered protocol and exhaustive search, nor a grounded-theory study, which would require coded primary data. It is a theory-led integration of established scholarship, and its claims are correspondingly bounded. Stating this plainly matters, because conceptual work sometimes borrows the vocabulary of systematic method without meeting its standards; the present article does not claim comprehensiveness of coverage but transparency of reasoning.

3.2 Identification of Sources

Although not a systematic review, the literature base was assembled through a transparent and reproducible procedure rather than by unexamined convenience. Five anchoring traditions were specified in advance: AI literacy, teacher technology and AI competence frameworks, Universal Design for Learning and accessibility engineering, critical disability studies, and the sociolinguistics of justice including translanguaging. For each tradition, foundational works were identified from authoritative reviews and frameworks, and the recent periphery was located through database searching in Scopus, Web of Science, and Google Scholar using paired terms that crossed the traditions, for example combining artificial intelligence or generative AI with language teacher education, accessibility, disability, or translanguaging. This was supplemented by backward and forward citation chasing from key nodes. Two inclusion priorities governed selection: theoretical centrality, so that the works that define each tradition were included regardless of date, and recency for the empirical periphery, with emphasis on 2020 to 2026 for AI in language education. The aim was not to capture every relevant study but to assemble a defensible and representative base spanning all five traditions, and the resulting corpus is disclosed in full in the reference list so that readers can scrutinize the evidentiary basis of each claim.

3.3 Construction of the Dimensions

Dimensions were constructed by interrogating each tradition against a single functional question: what must a language teacher know, value, and be able to reason about so that generative tools widen rather than narrow participation in language for the full range of learners, without reproducing deficit or assimilationist logics? Candidate components were generated against this question, then reduced through three operations. Overlapping components were consolidated; components that did not bear specifically on the intersection of

AI, language, and accessibility were excluded to preserve focus; and the remaining clusters were subjected to a boundary test requiring that each proposed dimension be separable from the others by a statement of what it is and what it is not. This boundary test, reported for each dimension in Section 4, directly addresses the risk that the dimensions merely relabel adjacent constructs. The reduction yielded four dimensions, anchored by the foundational traditions and oriented toward a single aim.

3.4 Testing the Framework

Rather than validating the framework against the sources from which it was derived, the study applied three checks that draw on resources external to that derivation. First, a differentiation check compared the framework against existing teacher-AI frameworks (DigCompEdu, AI-TPACK and Intelligent-TPACK, the UNESCO competency framework, and general AI-literacy models), asking whether it is non-redundant, that is, whether it makes visible or actionable something those frameworks do not; the outcome is reported in Section 4.6 and discussed in Section 5.1. Second, an application check submitted the framework to a worked illustrative case, a concrete language-teacher-education scenario, to examine whether the four dimensions generate distinguishable and usable guidance; the case is presented in Section 4.7. Third, a reflexivity check, described below, scrutinized the role of the author in the synthesis. These checks do not constitute empirical validation, which would require expert panels, classroom implementation, and learner outcomes, and the article is explicit that such validation remains future work. They do, however, replace circular self-confirmation with tests that can fail.

3.5 Reflexivity and Positionality

Because the synthesis was conducted by a single author, interpretive bias in the selection and reading of sources is a genuine threat to credibility. Three measures mitigate but do not eliminate it. The reasoning is made transparent: every dimension is mapped to identifiable scholarship in Table 1, so that readers can judge whether each claim is warranted by its cited basis. The framework is differentiated against competing models rather than presented in isolation, which exposes it to the discipline of comparison. And the author's standpoint is disclosed: the work is written from the perspective of educational technology and inclusive education research rather than from lived experience of disability, which is precisely why the framework foregrounds the principle of designing with disabled learners and teachers (Charlton, 1998; Spiel et al., 2020) and treats the absence of disabled voices in its own construction as a limitation to be remedied by the participatory validation set out in the agenda for future research.

3.6 Scope and Boundary Conditions

Two boundaries delimit the contribution. The framework is designed for language teacher education, both initial and continuing, and its unit of concern is the teacher as a designer of accessible participation, not the learner directly. And it is technology-aware but not technology-bound: it is articulated with reference to current generative tools, yet its dimensions are pitched at a level of abstraction intended to remain serviceable as specific systems evolve,

because the underlying demands (critical understanding, accessible design, inclusive mediation, and ethical stewardship) are likely to persist even as particular tools are superseded.

4. The Framework

4.1 Overview

The Inclusive AI Literacy for Linguistic Accessibility framework integrates the traditions reviewed above into a single model oriented toward one purpose: enabling language teachers to mobilize generative AI so that it widens, rather than narrows, participation in language for all learners, without reproducing deficit or assimilationist logics. At its center is the language teacher, conceived not as a technician who operates tools but as a reflective designer of accessible linguistic participation. Surrounding this center are four interdependent dimensions of capability, each integrating knowledge, disposition, and reasoning. The four dimensions rest on three foundations—AI literacy (Long & Magerko, 2020; Ng et al., 2021), Universal Design for Learning (CAST, 2018), and technological pedagogical content knowledge (Mishra & Koehler, 2006)—and are cross-cut by two orienting commitments that distinguish the framework from existing teacher-AI models: the social model of disability (Oliver, 2013; Charlton, 1998) and linguistic justice (Piller, 2016; Flores & Rosa, 2015). The whole is oriented toward linguistic accessibility and equitable participation. The number of dimensions is not arbitrary: each corresponds to a distinct object of teacher reasoning that the functional question isolates—knowledge of the system, design of the task, mediation of the interaction, and stewardship of aggregate consequences—so that the four are jointly exhaustive of the teacher’s decisions and mutually non-redundant, a claim the differentiation check in Section 4.6 tests. The two commitments are modeled as cross-cutting rather than as a fifth dimension because they must inform every dimension at once: a design decision, a mediation move, and an adoption judgment are each answerable to the social model and to linguistic justice simultaneously. Figure 1 represents this structure.

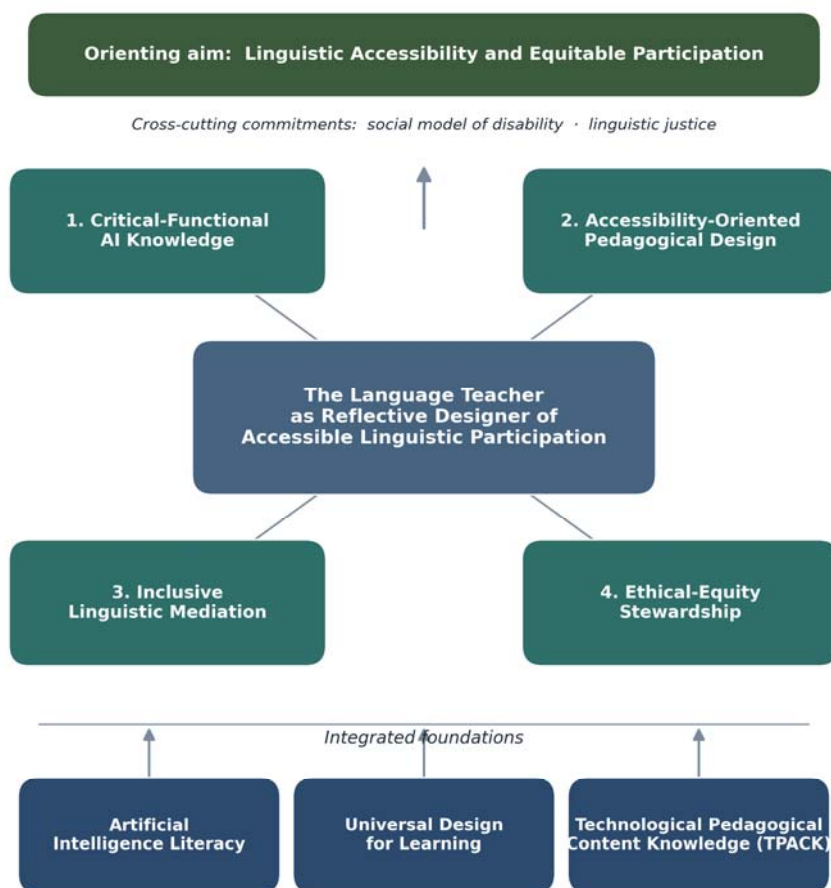


Figure 1. The inclusive AI literacy for linguistic accessibility framework for language teacher education

The dimensions are not stages but mutually reinforcing facets of one capability, distinguished analytically so that teacher education can address each deliberately. To guard against the objection that they merely relabel adjacent constructs, each dimension below is specified with a boundary statement declaring what it is, what it is not, and how it interfaces with its neighbors.

4.2 Dimension 1: Critical-Functional AI Knowledge

This dimension concerns what teachers must understand about generative AI to use it wisely. Its functional facet is a working understanding of what generative systems are and can do, and how they produce language (Long & Magerko, 2020; Ng et al., 2021; Chiu et al., 2024). Its critical facet is an understanding of how such systems encode the data and design choices of their makers, why their fluent outputs can be inaccurate or biased, and whom they advantage (Veldhuis et al., 2025). In language education the dimension acquires a distinctive edge, since the system's output is itself a specimen of the competence learners are developing; a teacher who grasps that an LLM produces statistically probable language calibrated to dominant varieties can anticipate that its corrections may erase an emerging voice or penalize legitimate varieties (Warschauer et al., 2023). Boundary: this dimension is epistemic, concerning

understanding of the tool and its language; it is neither the design of instruction (Dimension 2) nor the act of mediation (Dimension 3). It interfaces with Dimension 4 in that critical understanding informs ethical judgment, but knowing how a system distributes bias is analytically distinct from taking responsibility for that distribution. A teacher may understand model bias well yet design inaccessibly, or design accessibly with only a shallow grasp of the underlying technology; the dimensions can therefore vary independently.

4.3 Dimension 2: Accessibility-Oriented Pedagogical Design

This dimension is the capacity to plan language learning that anticipates the full range of learner variability and to orchestrate generative and assistive tools so that participation is open by design. Its foundation is UDL, whose location of barriers in inflexible curricula rather than in learners (CAST, 2018; Rao et al., 2023) supplies the design logic, complemented by accessibility standards (World Wide Web Consortium, 2018) and by the controlled-comprehensibility resources of Easy and Plain Language (Maaß, 2020). This is where TPACK is operationalized rather than invoked: designing accessible language learning with GenAI is an act of technological pedagogical content knowledge, because the teacher must reason simultaneously about the affordances of the tool, the pedagogy of access, and the linguistic content, and Intelligent-TPACK names the ethical integration this requires (Celik, 2023; Mishra, Warr, & Islam, 2023). A teacher exercising this dimension might provide an automatically simplified parallel text for some learners (Al-Thanyyan & Azmi, 2021; Ondov, Attal, & Demner-Fushman, 2022; Martínez, Ramos, & Moreno, 2024), captioned input for deaf and hard-of-hearing learners (Kuhn et al., 2023), and multiple generative pathways into a writing task (Bray et al., 2024). Boundary: this dimension is about planned design provided to all (Lomellini et al., 2025), not the moment-to-moment use of generated language with a particular learner (Dimension 3), and not the critical understanding that informs tool selection (Dimension 1). It is proactive and curricular, where Dimension 3 is responsive and interactional.

4.4 Dimension 3: Inclusive Linguistic Mediation

This dimension is the most specific to language education: the moment-to-moment mediation of machine-generated language so that it supports rather than supplants learners' developing competence, calibrated differentially across learners. The empirical literature documents productive uses—feedback on writing (Guo & Wang, 2024) and conversational practice that builds willingness to communicate (Fathi, Rahimi, & Derakhshan, 2024)—alongside the contradiction that the same affordances can erode the effort through which language is acquired (Warschauer et al., 2023), a risk sharpened by automation bias and metacognitive offloading (Lyell & Coiera, 2017; Fan et al., 2025). Crucially, mediation here is governed by the framework's two commitments. It is informed by the social model, so that assistive and generative supports, which show benefit for learners with reading and writing disabilities (Svensson et al., 2021), for users of augmentative and alternative communication (Pereira, Zanchettin, & do Nascimento Fidalgo, 2024; Kidwai, Brumberg, & Gatts, 2024), for visually impaired language learners (Schultz & Savaiano, 2023), and for vocabulary learning among autistic learners (López Urrea et al., 2024), are treated as the removal of designed barriers

rather than as compensation for individual deficit (Oliver, 2013; Goodley, 2014). It is equally informed by linguistic justice, so that the teacher mediates generated language without flattening learners' repertoires into a standardized norm, drawing instead on translanguaging as a resource (García & Wei, 2014; Cenoz & Gorter, 2021; Otheguy, García, & Reid, 2015). Boundary: this dimension is interactional and learner-specific, concerning what the teacher does with generated language in the act of teaching; it is neither the prior curricular design (Dimension 2) nor the equity stewardship that judges aggregate consequences (Dimension 4). The same simplified output that advances access for one learner may, mediated differently, foster dependency in another, which is what makes mediation a distinct pedagogical judgment. In this sense Dimension 3 is where the critical-functional AI knowledge of Dimension 1 becomes interactional: the teacher's understanding of how generative systems produce language is exercised, in real time, as a judgment about which learner a given output serves and which it supplants.

4.5 Dimension 4: Ethical-Equity Stewardship

This dimension is the teacher's responsibility for the equity consequences of AI integration at the level of groups and systems. It draws on the critical scholarship showing how language technologies redistribute power (Blodgett et al., 2020), how bias propagates through data and design (Mehrabi et al., 2021), how algorithmic harm falls unevenly (Birhane, 2021), and how the proliferation of ethics guidelines has not resolved the difficulty of translating principle into practice (Jobin, Ienca, & Vayena, 2019), and on raciolinguistic critique of who is positioned as deficient (Flores & Rosa, 2015; Rosa & Flores, 2017). It incorporates the structural realities of the digital divide (van de Werfhorst et al., 2022) and the critique of datafication and surveillance in education (Selwyn, 2015; Williamson, 2017), and it enacts the principle of designing with disabled learners and teachers rather than for them (Charlton, 1998; Spiel et al., 2020). Boundary: where Dimension 1 is epistemic understanding of bias, Dimension 4 is the assumption of responsibility for its consequences and the disposition to act on equity, including by refusing or redesigning a tool; understanding and stewardship are distinct, since a teacher may comprehend a harm without taking responsibility for mitigating it. This dimension functions as the framework's conscience, ensuring that the capabilities of the other three are exercised in the service of justice (Bond et al., 2024).

4.6 Mapping and Differentiation

Table 1 maps each dimension to its principal foundation and representative grounding, with primary and cross-cutting sources distinguished to show that the dimensions, while interdependent, are not built from an undifferentiated citation pool. Table 1 is thus the analytical core of the synthesis: it shows that the five traditions are not merely juxtaposed but integrated, each contributing to specific dimensions while the two commitments cut across them.

Table 1. Mapping of the four dimensions to foundations, cross-cutting commitments, and representative grounding

Dimension	Principal foundation	Cross-cutting commitment	Representative grounding
Critical-Functional AI Knowledge	AI literacy; critical AI literacy	—	Long and Magerko (2020); Ng et al. (2021); Chiu et al. (2024); Veldhuis et al. (2025)
Accessibility-Oriented Pedagogical Design	UDL; TPACK; accessibility standards	Social model of disability	CAST (2018); Rao et al. (2023); Celik (2023); Maaß (2020); World Wide Web Consortium (2018)
Inclusive Linguistic Mediation	GenAI in language education; assistive technology	Linguistic justice; translanguaging	Warschauer et al. (2023); García and Wei (2014); Cenoz and Gorter (2021); Fan et al. (2025)
Ethical-Equity Stewardship	Critical AI and NLP ethics; datafication critique	Linguistic justice; social model	Birhane (2021); Blodgett et al. (2020); Williamson (2017); Charlton (1998)

The differentiation check can now be stated. Existing teacher-AI frameworks (Redecker, 2017; Celik, 2023; Mishra, Warr, & Islam, 2023; UNESCO, 2024) supply rich accounts of digital and AI competence but treat accessibility and disability peripherally and do not theorize language as the medium of exclusion. The present framework is non-redundant precisely at the cross-cutting commitments: no existing model integrates the social model of disability and linguistic justice into the specification of teacher AI capability for language education. It is this integration, not the four dimensions in isolation, that constitutes the contribution.

4.7 An Illustrative Application

To test whether the dimensions generate distinguishable, usable guidance, consider a concrete scenario. A teacher educator is preparing pre-service secondary English teachers to integrate a generative writing assistant. The class includes a future teacher who will work with a dyslexic multilingual student. Through Critical-Functional AI Knowledge, the candidates examine how the assistant's suggestions standardize toward a dominant variety and learn to detect where it would overwrite the student's translingual choices. Through Accessibility-Oriented Pedagogical Design, they build a task that offers, to the whole class, an Easy-Language parallel text, captioned exemplars, and a choice of drafting pathways, rather than singling the student out for accommodation. Through Inclusive Linguistic Mediation, they rehearse calibrating the assistant so that it scaffolds the dyslexic student's drafting without supplying finished

sentences that would short-circuit learning, while welcoming the student's home-language resources rather than correcting them away. Through Ethical-Equity Stewardship, they consider data privacy, whether all students have device access, and whether the tool's variety bias disadvantages racialized multilingual writers, deciding collectively how to adapt or supplement it. The scenario shows the dimensions yielding four distinct, jointly necessary forms of guidance, and it shows the two commitments doing real work: without the social model the student would be positioned as deficient, and without linguistic justice accessibility would collapse into standardization.

4.8 From Dimensions to Objectives

To address the charge that conceptual frameworks rarely become actionable, Table 2 translates each dimension into illustrative learning objectives and assessment evidence for teacher education, providing a starting architecture that programs can adapt and that subsequent empirical work can operationalize.

Table 2. Illustrative learning objectives and assessment evidence by dimension

Dimension	Illustrative learning objective	Assessment evidence
Critical-Functional AI Knowledge	Analyze a generated text to identify variety bias and inaccuracy	Annotated critique of AI output with linguistic justification
Accessibility-Oriented Pedagogical Design	Design a UDL-aligned language task integrating an accessibility tool for all learners	Task plan with explicit access rationale and standards check
Inclusive Linguistic Mediation	Calibrate AI support differentially for a profiled learner without supplanting effort	Mediation script plus reflective commentary on learner agency
Ethical-Equity Stewardship	Appraise the equity, privacy, and access implications of a tool and decide on adoption	Equity impact statement with a justified adoption or refusal decision

5. Discussion and Concluding Considerations

5.1 Contribution and Differentiation

The framework's contribution is best stated modestly and precisely. It does not invent new atomic constructs, nor does it claim that teachers and AI have been ignored. It specifies and integrates an intersection that existing teacher-AI frameworks border but do not enter. DigCompEdu (Redecker, 2017), the AI extensions of TPACK (Mishra, Warr, & Islam, 2023; Celik, 2023), and the UNESCO (2024) competency framework offer strong accounts of digital and AI competence, and AI-literacy models specify critical understanding (Long & Magerko, 2020; Ng et al., 2021); none, however, places linguistic accessibility at its center or theorizes

disability and linguistic diversity as constitutive rather than peripheral. The present framework's distinctiveness lies in its two cross-cutting commitments: by integrating the social model of disability (Oliver, 2013; Charlton, 1998) and linguistic justice (Piller, 2016; Flores & Rosa, 2015) into the specification of teacher AI capability for language education, it reframes what competence means, from extracting productivity from a tool to designing language learning in which generative technologies extend participation to learners otherwise excluded. The reframing aligns teacher AI education with the equity commitments the field increasingly demands (Bond et al., 2024; Veldhuis et al., 2025). What this reframing asks of teacher education—of educators, curriculum designers, and teachers—is made concrete in Section 5.4.

5.2 Engaging the Objections

A framework that recommends mobilizing GenAI must confront serious objections rather than dissolve them. The first is de-skilling. If learners offload the effortful processes through which language is acquired, GenAI may erode the very competence it appears to support, a risk grounded in robust evidence of automation bias (Goddard, Roudsari, & Wyatt, 2012; Lyell & Coiera, 2017) and recent findings of metacognitive laziness under AI assistance (Fan et al., 2025). The framework does not resolve this objection by optimism; it locates the response in Inclusive Linguistic Mediation, which obliges the teacher to calibrate support so that it scaffolds without supplanting, and treats the preservation of productive effort as a design constraint rather than an afterthought. The second objection concerns datafication and surveillance: introducing commercial generative tools can extend the monitoring and commodification of learners (Selwyn, 2015; Williamson, 2017; Williamson, Eynon, & Potter, 2020). The framework answers through Ethical-Equity Stewardship, which makes privacy, data, and the legitimacy of adoption explicit objects of teacher judgment, including the judgment to refuse. The third and subtlest objection is internal to the framework's own aim: accessibility can curdle into assimilation, simplifying language toward a dominant standard and thereby reproducing raciolinguistic hierarchy (Flores & Rosa, 2015; Rosa & Flores, 2017). This tension between cognitive simplification (Maaß, 2020) and linguistic justice is not eliminated but made constitutive: the framework defines linguistic accessibility as participation through learners' full repertoires (García & Wei, 2014), so that simplification is a situated tool to be used reflectively, never the goal. Naming these tensions, rather than claiming to have solved them, is part of what the framework offers.

5.3 Contexts of Inequality

The stakes are uneven across contexts, and a framework attentive to justice must say so. In under-resourced and multilingual settings, including much of the Global South, the digital divide conditions whether any generative tool is reachable at all (van de Werfhorst et al., 2022), language models perform worst on the languages and varieties of already marginalized communities (Blodgett et al., 2020), and infrastructural precarity can turn a promised affordance into a new axis of exclusion. The plurilingual realities of such settings (Canagarajah, 2013; Coste, Moore, & Zarate, 2009) make the assimilationist risk especially acute, since tools optimized for dominant varieties may pressure rich repertoires toward a narrow norm. The framework is offered as portable in principle but requires contextual adaptation, and its

application in low-resource, multilingual education is among the most important directions for the work it begins.

5.4 Implications for Practice

Because the framework's value depends on becoming actionable, its implications are stated concretely for the three constituencies that carry teacher education. For teacher educators, the four dimensions supply a sequence for a course or module: begin with Critical-Functional AI Knowledge so that candidates can interrogate what generative systems do to language, move through Accessibility-Oriented Pedagogical Design and Inclusive Linguistic Mediation in tandem with practicum, and close with Ethical-Equity Stewardship as the lens for program-level decisions; the objectives and assessment evidence in Table 2 offer a ready starting architecture. For curriculum designers, the dimensions map onto existing components rather than requiring a new course: Dimension 1 extends the applied-linguistics and language-and-technology strands, Dimension 2 belongs with methods and materials design, Dimension 3 with practicum and assessment, and Dimension 4 with the ethics, policy, and professionalism strand, so that the framework can be embedded by redistribution rather than addition. For language teachers, each dimension names one concrete practice: auditing a generated text for variety bias before use (Dimension 1), building a task with a designed-in accessibility option for every learner (Dimension 2), calibrating AI support to a specific learner without doing the linguistic work for them (Dimension 3), and documenting a reasoned decision to adopt or refuse a tool on equity grounds (Dimension 4). Stated this way, the framework yields not an aspiration but a small set of teachable, assessable moves.

5.5 Limitations

Several limitations qualify the contribution. The framework is a conceptual proposal tested by differentiation and a worked case, not by empirical validation; it has not been examined through expert panels, classroom implementation, or learner outcomes, and the illustrative case demonstrates usability but cannot establish effectiveness. The synthesis was conducted by a single author writing from outside the lived experience of disability, and although the reasoning is made transparent and the framework foregrounds designing with disabled people, the absence of disabled learners and teachers from its own construction is a substantive limitation that only participatory development can remedy. The empirical base on GenAI in language education is recent, heterogeneous, and short-term, so claims resting on it are provisional. And the framework is articulated primarily with reference to English and widely studied populations; its transfer to other languages and under-resourced contexts requires development rather than assumption.

5.6 A Research Agenda

These limitations define an agenda. The most pressing need is participatory validation that places disabled language learners and teachers, and multilingual communities, as co-designers rather than subjects, in keeping with the principle of “nothing about us without us” (Charlton, 1998; Spiel et al., 2020). Expert review by language teacher educators and accessibility specialists could refine the dimensions and their boundaries, and instrument development

building on existing GenAI-literacy scales (Wang, Derakhshan, & Ghiasvand, 2025; Ng et al., 2024) could operationalize the four dimensions for comparison across programs. Design-based research could test whether teacher education organized around the framework produces measurable gains in inclusive AI practice, and classroom studies could examine how Inclusive Linguistic Mediation is enacted and how learners with specific profiles experience GenAI-mediated instruction. Finally, the framework invites extension beyond English and well-resourced settings, including investigation of how the digital divide and the dominance of standardized varieties shape accessibility in multilingual, low-resource contexts.

5.7 Conclusion

As generative AI becomes infrastructural to language teaching, the decisions teachers make, often without an organizing framework, will help determine whether these technologies expand the circle of participation in language or quietly redraw its boundaries. This article has argued that competence with GenAI in language education cannot be reduced to technical fluency, and has proposed a framework that integrates AI literacy, Universal Design for Learning, and TPACK with the social model of disability and linguistic justice, organized around four interdependent dimensions and a teacher positioned as a designer of accessible participation. The framework is a beginning rather than a settlement: it names an intersection, gives it structure, differentiates it from what exists, and submits itself to tests that can fail. Its value will be decided by the participatory and empirical work it is designed to invite. What it insists upon is that the question of who is included, on whose terms, and by whose design remains at the center of the field's response to its most transformative technology.

Acknowledgements

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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