



Review

# Integrating Language-Sensitive Pedagogy Across Disciplines: A Qualitative Exploration of Interdisciplinary Practices in Multilingual Education

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## A B S T R A C T

This study examines the implementation of language-sensitive pedagogy in the disciplinary contexts of multilingual higher education. Leveraging seminal theoretical frameworks such as the ROAD-MAPPING model (Dafouz & Smit, 2020), translanguaging theory (García & Wei, 2014), and disciplinary literacy (Shanahan & Shanahan, 2008), the article directly attends to long-standing content-area instruction deficits, whereby language often remains an extremely neglected but requisite element in knowledge construction. Using a qualitative synthesis of research evidence, the study examines cross-disciplinary practices, including integrated content and language teaching, co-teaching, language-responsive curriculum design, and professional collaboration between content and language specialists. Outcomes reveal institutional and ideological barriers, such as monolingual norms and inadequate policy support; yet, they also inform transformative approaches that reconceptualize multilingualism as a pedagogical resource. The article argues for structural and ideological reforms in higher education systems through policy-making, curriculum development, and teacher training to promote equity and linguistic inclusion, and suggests an institutional model of reforms based on the integration of disciplinary knowledge and linguistic capability to bridge the divide between language and content. Finally, it calls for a reconceptualization of teaching practice that places language at the center of disciplinary learning, allowing all students, regardless of their linguistic background, to contribute fully and richly to the life of the academy.

## I. INTRODUCTION

In a more globalized higher education environment, language-sensitive pedagogy has emerged as the basis of inclusive and equitable university teaching (Dafouz & Smit, 2020). Language-sensitive pedagogy is defined as language-sensitive education “that positions language at the center of teaching and learning, integrating it purposefully within disciplinary instruction” (Dafouz & Smit, 2016, p. 399). Language-sensitive pedagogy encourages instructors to consider the distinct language needs within each higher education domain (Dafouz

& Smit, 2020, p. 4). This refers to the idea that language is not only a vehicle of communication but, first and foremost, an intrinsic way in which knowledge is created, accessed, and conveyed within disciplinary contexts. Through this, it enables teachers to incorporate language as a substantive component of pedagogy throughout the entire curriculum, rather than merely within the traditional language classroom.

In multilingual higher education systems, even those undergoing rapid educational reforms, more and more students are exposed to content provided in languages other than their primary

linguistic repertoire. These emerging trends have increased concerns regarding equity, epistemic access, and academic language as a shaping force in learning outcomes. Running in parallel with these discourses, global trends such as EMI, CLIL, and ICLHE have placed language-sensitive pedagogy at center stage as an indispensable response to the challenges faced by linguistically diverse learners.

As schools struggle to deal with increasingly diverse student populations, it has become increasingly clear that language practices and scholastic achievement are closely connected. Scholars such as García and Wei (2014) have set forth the theory of translanguaging, which involves the dynamic, strategic use of students' whole linguistic capacities in the classroom, thereby busting monolingual myths and creating more inclusive and effective classroom communication.

Even while there is convergence on the theoretical level, pedagogy in the classroom is balkanized by language department conventions, and areas of content are left along for the ride on the untested assumption that language use is a taken-for-granted backdrop and not something to be learned. This compartmentalization may become particularly disorienting in multilingual school environments, where second or foreign languages are introduced in class teaching, and students must work with challenging academic registers throughout the curriculum. Research has shown that linguistic skill is strongly intertwined with epistemic access, enabling individuals to function as active agents in generating knowledge in educational contexts (Zamel & Spack, 2006).

Subject pedagogy's requirement for writing language awareness is secured (Liddicoat, 2018; Marshall, 2020), but in reality, it is uneven. Content teaching tends to overlook the language dimension of learning, creating classroom environments that quietly disempower multilingual students (Hakuta et al., 2013).

The attention to language-sensitive pedagogy up until now has focused on EMI implementation (Dearden, 2015), the preparedness of teachers (Aalto & Tarnanen, 2017), university-based translanguaging, or disciplinary literacy (Shanahan & Shanahan, 2008), albeit within English-dominant or Western higher education settings. Regardless of the fact that such integration is critical, many of the same studies detail how teachers continue to lack

formal preparation, mostly receive inconsistent institutional support, and frequently practice pedagogies misaligned with the students' linguistic realities. In spite of these contributions, scarce empirical or analytical work has concerned how language-sensitive approaches are conceptualized, adapted, or resisted within multilingual contexts of the Global South, of which Algeria forms a part. Few pieces of research investigate how translanguaging enters into a relationship with institutional language policies, how the language issue is perceived by content teachers, and how local linguistic ecologies inform pedagogic choices. It is for this reason that language-sensitive pedagogy within Algerian Higher Education shall be researched through an explicitly context-sensitive approach.

While the prior literature underlines the contribution of language-sensitive pedagogy, many lacunas still exist. Much of the research remains theoretical, while very limited effort is made to present evidence on how such pedagogy is actually implemented in university classrooms. Research is highly concentrated in Western and English-dominant contexts; multilingual countries, such as Algeria, are underrepresented. Indeed, very little is known about how translanguaging practices either engage with or challenge institutional language policies and how content instructors perceive their role in supporting students' language needs. Given these facts, the practical, contextual, and instructor-level dimensions of language-sensitive pedagogy remain underexplored within multilingual higher education.

The novelty of the present study includes its multilingual and non-Western focus in higher education, offering a systematic and discipline-transcending analysis that bridges theoretical frameworks with context-dependent pedagogical realities. It addresses institutional, epistemic, and instructional layers that have not been jointly examined in prior research.

Despite such a background, this article advocates for a reconceptualization of language-sensitive pedagogy, not as an add-on support, but as an integral part of disciplinary teaching and learning. Situated at the intersection of several academic disciplines, this study contributes to an emerging body of interdisciplinary work that views linguistic diversity as a pedagogical resource rather than a liability. By bringing together qualitative research,

this article aims to describe and investigate the practices that position language awareness within subject teaching, providing both practical and theoretical insights into how multilingual students can be better supported within higher education.

The problem addressed in this study is that even as universities place greater emphasis on multilingualism, language support is often isolated from content instruction by disciplinary borders. Such isolation has the potential to undervalue students' comprehension, engagement, and performance, especially when learning occurs in a non-domestic and non-native language for students. Such disconnection between content and language heightens inequalities in the availability of academic success for linguistically diverse students.

Against this background, this study reviews the practice of language-sensitive pedagogy in interdisciplinary higher education teaching. It takes into consideration the points at which language and content intersect across disciplines and explores strategies advantageous for multilingual students by using inclusive, linguistically responsive teaching.

The study is guided by the following questions:

1. What is language-sensitive pedagogy, and how is it achieved across subject areas in multilingual higher education?
2. How do interdisciplinary responses to students' language demands take place in content-area instruction?
3. What are the institutional, pedagogical, and ideological opportunities and challenges that condition the integration of language support into non-language subjects?

## II. METHODS

This qualitative review employs a descriptive-analytical design to facilitate an in-depth examination of how language-sensitive pedagogy effectively integrates with disciplinary teaching in multilingual higher education settings. This design is considered proper because it synthesizes concepts, principles, and practices across disciplines, rather than relying on empirical data collected within classroom settings. It is based on a systematic review of the available literature in which shared themes, teaching approaches, and

organizational issues have been reported.

The literature has been selected based on preset inclusion and exclusion criteria, ensuring a methodologically transparent process. For inclusion, the selected studies required: 1) demonstrate pedagogical sensitivity to or awareness of issues associated with language in higher education; 2) focus on disciplinary literacy, academic language, or content-language integration; and 3) be a peer-reviewed article or a book chapter. Therefore, all references unrelated to the relevant themes were excluded.

Accordingly, a total of 71 studies were purposively selected from the following academic databases: Scopus, Web of Science, ERIC, and Google Scholar. Data sources were utilized in developing a representative sample of internationally diverse research on language-sensitive teaching across various disciplinary areas, including science, social sciences, engineering, and humanities. Data collection consisted of information extracted on the focus of the research, conceptual framing, methodological orientation, and pedagogical practices discussed in each study.

Emergent themes were refined successively through re-reading repeatedly and cross-comparison of findings across studies. The researchers established credibility by documenting all the analytical decisions made throughout the analytical process and checked the emerging themes against multiple sources to establish consistency. Divergent perspectives across studies were examined to avoid overgeneralization and maintain a balanced interpretation of the literature. In general, the descriptive-analytical synthesis is a logical methodological framework through which the answers to the research questions are sought. No primary data collection was conducted in this study; therefore, the systematic procedures for selection, analysis, and validation enhance the transparency and reliability of the results.

## III. RESULT

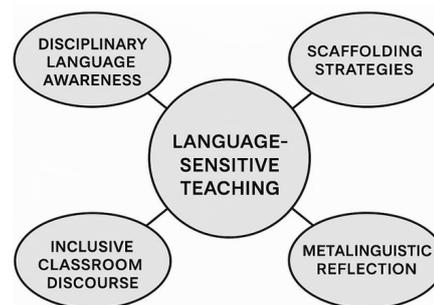
### Language-Sensitive Teaching across Disciplines in Multilingual Higher Education

Language-sensitive instruction has emerged as a central pedagogical practice in multilingual higher education, where students' diverse linguistic repertoires are brought into contact with the disciplinary requirements of academic fields.

As universities around the world have become increasingly linguistically and culturally diverse, the integration of language and content teaching has moved to the forefront of the agenda among scholars and teachers. As a result, a new corpus of research has emerged, investigating how content instruction can be focused on not only discipline-specific content instruction but also academic language learning (Dafouz & Smit, 2020). This chapter critically examines how pedagogies attuned to language are theorized and taught across the disciplines, with particular reference to key themes such as theoretical basis, institutional language, disciplinary differentiation, teacher collaboration, and challenges to the production of plurilingualism in higher education institutions.

At the core of language-sensitive teaching is a valuation of the fact that each scholarly discipline has its own linguistic and epistemological traditions that stretch far beyond everyday conversational competence or general knowledge. As Shanahan and Shanahan (2008, p. 48) argue, “literacy demands become more specialized as one moves through the education system,” and students will thus have to learn not only subject matter but also how to master discipline-specific types of communicating, reasoning, and representing. This aligns with recent calls for making language an overt feature of disciplinary pedagogy, where language is no longer an ancillary but a constitutive role in the construction of academic knowledge (Dafouz & Smit, 2020). Language, in this view, is both the medium and object of instructional dualism, serving as evidence of the canons of educational linguistics (Dafouz & Smit, 2020, p. 264).

Shanahan and Shanahan (2008) further indicate that disciplinary literacy involves more than the use of technical terms; it requires mastering each discipline’s thought, symbol systems, and conventions of communication. For instance, whereas historians sift through different perspectives and evaluate sources for bias and credibility, in chemistry, there is a use of symbolic notation combined with descriptive narration. In mathematics, there are expectations for iterative reasoning, abstraction, and conciseness of expression. These modalities of disciplinary practice cannot be reduced to anything other than specific uses of language, and thus, content teaching must be equally language-conscious and literacy-intensive.



**Fig. 1. Key Elements of Language-Sensitive Teaching in Multilingual Higher Education**

Source: Adapted from Dafouz & Smit (2020); Shanahan & Shanahan (2008)

To illustrate pedagogical features of language-sensitive teaching, the following figure, based on the integrative models of Dafouz and Smit (2020) and Shanahan & Shanahan (2008), shows four interconnected dimensions that underpin this paradigm: disciplinary language awareness, scaffolding practices, metalinguistic self-awareness, and inclusive classroom debate. These are located within and are mediated by wider institutional contexts that either enable or constrain their use.

The initial dimension, disciplinary language awareness, refers to the teacher’s capacity to notice and make visible the specific discourse practices, genres, and communicative conventions that characterise how knowledge is established and transmitted within their discipline. According to Shanahan and Shanahan (2008, p. 56), “each discipline has its own norms not only for communicating but also for thinking,” which necessitates tailored literacy instruction embedded in the subject matter itself. Not doing so, teachers may expect students to “pick up” academic language incidentally, disregarding the need for strategic and explicit language support.

In the interest of enabling access to such disciplinary forms of meaning-making, teachers must adopt scaffolding approaches—provisional pedagogical supports designed to assist learners on the path from dependence to autonomy. Such include modeling, guided tasks, visual aids, sentence frames, and pre-teaching targeted vocabulary. In multilingual classrooms, where the languages of the students are very disparate, scaffolding plays an important role in making academic language more transparent and accessible (Dafouz & Smit, 2020, p. 267). Scaffolding also strengthens sociocultural

**Table 1. Summary of Previous Studies on Language-Sensitive Pedagogy and Multilingual Higher Education**

Authors / Year	Title / Focus	Objective	Methods	Key Findings
Dafouz & Smit (2020)	Language-sensitive pedagogy; ROAD-MAPPING framework	Conceptualize language as central to disciplinary teaching	Theoretical model	Language central to knowledge construction; systemic alignment needed
Shanahan & Shanahan (2008)	Disciplinary literacy	Examine literacy demands across disciplines	Literature review	Language must be learned within discipline for academic success
Marshall (2020)	Plurilingualism in Canadian university	Investigate plurilingualism vs monolingual expectations	Qualitative interviews	Teachers value plurilingualism but feel pressured to assess monolingually
Spiliotopoulos (2018)	Faculty collaboration in EMI	Explore interdisciplinary collaboration	Case study	Collaboration supports consistent pedagogy and language integration
Aalto & Tarnanen (2017)	Pre-service teachers' beliefs	Analyze teacher candidates' skills and perspectives	Mixed methods	Teachers lack tools to apply language-sensitive pedagogy effectively
Dimova & Kling (2020)	Variability of ICLHE	Examine contextual differences in ICLHE	Comparative analysis	ICLHE must adapt to local linguistic ecologies
Dafouz & Smit (2020)	ROAD-MAPPING framework	Present multidimensional model of ICLHE	Theoretical synthesis	ICLHE requires institutional embedding across policy and practice
Zamel & Spack (2006)	Writing for language development	Examine role of writing feedback	Classroom research	Writing with feedback supports language growth; shared responsibility
Liddicoat (2018)	Language pedagogy as transdisciplinary	Link language, identity, and culture	Theoretical discussion	Culturally sensitive pedagogy enhances learning
Kelly (2015)	Barriers to multilingual education	Identify institutional obstacles	Policy analysis	Monolingual ideologies and rigid curricula hinder reform
Yanaprasart (2020)	Language policy mismatch	Compare policy vs actual needs	Policy analysis + faculty data	Policies often fail to match disciplinary language needs
Xin, K. & Yap, T. T. (2025)	Balancing Language Learning with Translanguaging: Insights from Yunnan Agricultural University	Investigate how translanguaging supports multilingual learners and identify risks/benefits in higher-education English classes.	Mixed methods: student surveys, teacher interviews, classroom observation.	Translanguaging enhances comprehension, reduces anxiety, and supports mixed-proficiency groups; overreliance on L1 can restrict academic English development; recommends balanced, context-sensitive use.
Elkhayma, R. (2022)	English as a Medium of Instruction: Exploring Benefits and Challenges in the 21st Century	Outline EMI's pedagogical and institutional implications in non-Anglophone contexts.	Conceptual / literature review.	EMI boosts internationalization but raises equity issues; highlights need for language-supportive pedagogy and teacher training.
Elbourkhissi, L. (2025)	Language Policy and the Pursuit of a New Linguistic Identity in Morocco	Examine pro-English discourse on Twitter and its implications for higher-education language policy.	Digital discourse analysis; thematic coding.	Online debates show tensions between globalization and local language identities; public narratives influence EMI and multilingual policy direction.

accounts of learning that emphasize the role of mediated interaction in knowledge construction.

The summary below outlines some key studies that explored language-sensitive pedagogy and scaffolding practices in multilingual higher education contexts. It provides a visual for the evidence discussed above.

From the Table 1, several important insights can be drawn about language-sensitive pedagogy and multilingual higher education. First, it is clear that language is central to academic success, not just as a tool for communication but also for constructing knowledge across disciplines, highlighting the need to integrate language

awareness into teaching (Dafouz & Smit, 2020; Shanahan & Shanahan, 2008). However, there is tension between the value of plurilingualism and the monolingual expectations of institutions, with teachers often feeling pressure to assess students monolingually despite recognizing the benefits of multilingualism (Marshall, 2020). The importance of interdisciplinary collaboration is also evident, as it fosters consistency in pedagogy and better integration of language across academic fields, particularly in English-Medium Instruction (EMI) contexts (Spiliotopoulos, 2018). Furthermore, many studies point out that teacher training and support are critical, as educators often lack the tools and resources to implement language-

sensitive pedagogy effectively, signaling a need for more professional development and institutional backing (Aalto & Tarnanen, 2017). Contextual adaptation of pedagogy is essential, as language-sensitive practices must be flexible and responsive to the specific linguistic needs of students and local environments (Dimova & Kling, 2020). Translanguaging emerges as a helpful tool for multilingual learners, reducing anxiety and supporting comprehension, though excessive reliance on a student’s first language can limit academic English development, suggesting the importance of balanced usage (Xin & Yap, 2025). Moreover, cultural sensitivity in pedagogy enhances learning by recognizing the connection between language, identity, and culture, ensuring inclusive and relevant teaching practices (Liddicoat, 2018). Finally, institutional barriers, such as monolingual ideologies and rigid curricula, hinder the effective implementation of multilingual education, pointing to the need for policy reform and a more inclusive institutional approach (Kelly, 2015). In summary, the findings emphasize the need for a more integrated, flexible, and culturally sensitive approach to language pedagogy, alongside better alignment between policies, teacher training, and the language needs of multilingual students.

### Interdisciplinary Strategies to Support Language Needs in Content-Area Instruction

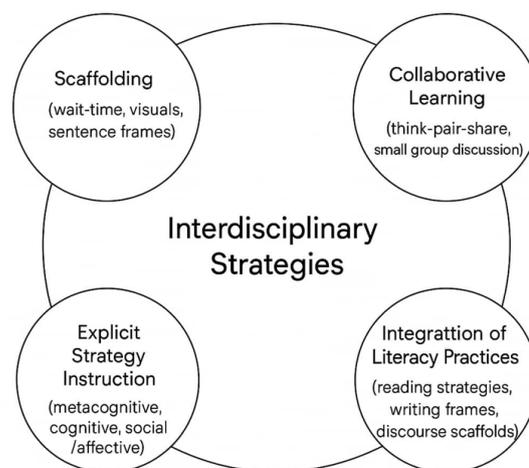
Based on the information presented in the previous section on language-sensitive pedagogy across the disciplines, this section examines how interdisciplinary techniques are being employed to address students’ language needs in content-area teaching. As classrooms become increasingly multilingual—most notably in urban and global education settings—the alignment of language learning and disciplinary learning is both a pedagogical necessity and an equity mandate. Instead of separating content and language as isolated disciplines, new interdisciplinary theories place their interdependence at the center and invite models of pedagogy that co-develop them.

This is consistent with broader changes in pedagogy and educational theory. Whereas previously the language support for English language learners (ELLs) had been remedial or single-language-based, more recent paradigms encourage language teaching that embeds real academic activities. When language ceases to be

simply a tool of communication under the integrated paradigm but becomes a peer to disciplinary thought, students are challenged to construct arguments, justify rationales, read data, and analyze academic texts—each of these requiring fine-grained linguistic skills. Consequently, cross-disciplinary practices, blended with language assistance and content, have become the norm for policymakers, educators, and researchers.

One of the first to practice this blending is Chamot and O’Malley’s (1987) Cognitive Academic Language Learning Approach (CALLA). CALLA blends academic content instruction with direct instruction in learning strategies and is specifically tailored for students with little English proficiency. CALLA facilitates the use of metacognitive strategies (e.g., planning and self-monitoring), cognitive strategies (e.g., summarizing, categorizing), and social/affective strategies (e.g., asking for clarification, group work). The strength of CALLA lies in its responsiveness to the linguistic and cognitive loads imposed on learners, and in situating language as a thinking process rather than merely as a vehicle for expression.

Figure 2 presents a model of CALLA-inspired practices to show how strategies from each interdisciplinary component—scaffolding, for example, through wait-time, pictures, sentence frames; collaborative learning via think-pair-share, small group discussion; and the embedding of literacy practices, such as reading strategies, writing frames, and discourse scaffolds—operate



**Fig. 2. Interdisciplinary Strategies for Language Support in Content-Area Instruction**

Source: Adapted from Chamot & O’Malley (1987); Grapin et al. (2020); Lee & Buxton (2013)

**Table 2. Studies on Language-Content Integration and Inclusive Pedagogies**

Authors / Year	Title / Focus	Objective	Methods	Key Findings
Dong (2002)	Biology teachers integrating L2 support	Show how teachers integrate language support without lowering rigor	Classroom study; teacher observations	Culturally responsive instruction supports ELLs while maintaining academic rigor
Markic (2014)	CLIL in linguistically diverse science classrooms	Explore collaborative module design for CLIL environments	Qualitative; CLIL-based intervention	Linguistic diversity becomes a strength; improved content learning and inclusiveness
Houston (1987)	ELDAC project: English Language Development Across Curriculum	Assess effects of systematic language integration across subjects	Large-scale curriculum intervention	Integrated language instruction benefits all students; must be institutionally supported
Meyliyeva (2025)	English integration in technical universities	Investigate emerging practices in non-philological fields	Case study; interviews	Even technical domains can contribute to L2 learning when innovation is supported
Short (2017)	SIOP Model for content-area teaching	Describe SIOP and its impact on ELLs	Model description + empirical results	Improved academic language, writing, and comprehension; requires PD and fidelity
Domke & Cerrato (2024)	Meta-review of 199 integration studies	Review effectiveness and challenges of content-language integration	Meta-review	Teacher support strong but hindered by lack of preparation; best practices identified
Kennedy & Ihle (2012)	Content teaching for students with disabilities	Examine disciplinary language demands in special education	Classroom-based research	Need explicit content-language links; multimodal materials improve access
Bin-Hady, W. (2024)	EFL Teachers' Attitudes Towards a Glocalized Approach	Explore teachers' perceptions of integrating local content with global EFL aims.	Mixed methods: questionnaires + interviews with EFL teachers.	Teachers consider glocalization to be the process of making learning meaningful and inclusive, yet the practice is always obstructed by a lack of materials and institutional support.
Krishna, D. (2021)	Importance of Language Laboratory in Developing Language Skills	Explain how language laboratories enhance inclusive skill development for diverse learners.	Descriptive analysis of language-lab practices.	Labs provide multimodal, scaffolded tasks that support both language development and content-related skill building; useful for inclusive pedagogy.

together to accelerate content and academic language development. These strategies extend beyond traditional language support, highlighting the reality that language and content must be addressed together.

Research literature offers a more nuanced understanding of how these strategies function in various educational settings. Grapin et al. (2020) argue that vocabulary preteaching and visual support, as instructional practices, need to be reimaged in the context of more sophisticated theories of language learning. They advocate for sociocultural and cognitive theories of learning that are adaptive, thoughtful, and sensitive to the cognitive demands of disciplinary tasks. This represents a step back from “one-size-fits-all” pedagogy and requires pedagogies that address the lived experiences of multilingual learners.

The table below presents research on language-content integration and inclusive pedagogical practices, highlighting how these approaches are

applied in various educational settings.

From Table 2, several important insights emerge about effectively integrating language and content in inclusive educational settings. One key finding is that language support can be provided without compromising academic rigor. For instance, Dong (2002) demonstrates that culturally responsive instruction can support English Language Learners (ELLs) while maintaining high academic standards. Additionally, Markic (2014) shows that linguistic diversity can be leveraged as a strength in classrooms, with CLIL (Content and Language Integrated Learning) enhancing both content learning and inclusiveness. The importance of institutional support is also evident, as highlighted by Houston (1987), who found that language integration benefits all students, but requires institutional frameworks for sustained success. In technical education, Meyliyeva (2025) shows that even non-philological fields can contribute to language learning when innovative practices are supported. The SIOP model, as discussed by Short (2017), has

been shown to improve academic language, writing, and comprehension; however, it requires professional development and consistent implementation. Teacher preparation and support are critical, as Domke & Cerrato (2024) highlight the barriers caused by a lack of training, despite the availability of best practices. In special education, Kennedy & Ihle (2012) emphasize the need for explicit content-language links, with multimodal materials improving access to content for students with disabilities. Bin-Hady (2024) demonstrates that glocalization, which integrates local content with global EFL aims, can make learning more inclusive; however, challenges persist due to a lack of materials and support. Finally, Krishna (2021) highlights the role of language laboratories in providing multimodal, scaffolded tasks that enhance both language development and content-related skills, making them valuable tools for inclusive pedagogy. These studies collectively emphasize the importance of integrating language support into content teaching, supported by institutional frameworks, teacher training, and innovative practices, to create more inclusive learning environments.

Collectively, these interdisciplinary approaches share a similar commitment to equity, inclusivity, and integration in teaching. The studies reviewed portray effective language support as something more than an add-on, but rather as an integral part of academic schooling. The convergence of CALLA, science-literacy integration, inclusive disability strategies for students with disabilities, and systematic program reviews reflects the complex nature of language learning and the interdisciplinary cooperation required therein.

While such strategies do offer potential, success from these approaches rests on a set of interrelated conditions, including staff development, administration, curriculum alignment, and contingent implementation. Without institutional support and theory, even the most genuinely motivated strategies can rapidly devolve into superficial or tokenistic gestures.

### Challenges and Opportunities in Integrating Language Support into Non-Language Subjects

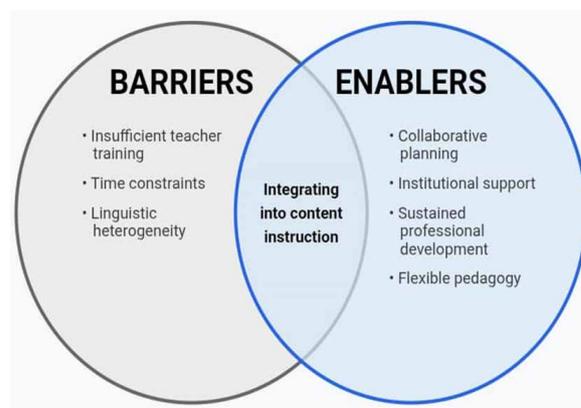
Whereas the preceding sections have addressed disciplinary and inter-disciplinary responses to language-sensitive pedagogy, this section draws on a critical examination of the practical and theoretical nuances of embedding language support in non-language subjects. As schools

and institutions of higher learning become more linguistically diverse with student bodies, there has never been greater urgency to build academic language across all domains of study. Yet, however crucially recognized it may be, the implementation of integrated language support is uneven, frequently hindered by systemic, pedagogical, and ideological barriers.

At the core of these challenges is the relative unpreparedness of subject experts to take up language teaching. Livingston et al. (2022), in their needs analysis, for example, indicate that subject lecturers tend not to be aware of existing models, such as LAC and DL. These teachers often note that they are ill-equipped to teach academic language, assist students in understanding readings, or scaffold complex activities with language as part of content instruction. Compounding this lack is a lack of professional development, inadequate planning time for team planning, and rigid curricular models that keep language learning separate from content knowledge.

Figure 3 makes this polarity graphic. On the left, it identifies hard-to-address constraints, such as teacher under-preparation, time pressures, and language diversity in classes. On the right, it identifies vital enablers such as collaborative planning structures, institutional support, prolonged professional development, and pedagogy responsive to learners' needs. They are the conditions under which language integration in non-language subjects collapses or flourishes.

The pedagogical consequences are significant. Hakuta, Santos, and Fang (2013) note that



**Fig. 3. Barriers and Enablers in Integrating Language into Content Instruction**

Source: Adapted from Livingston et al. (2022); Hakuta et al. (2013); Domke & Cerrato (2024)

**Table 3. Studies on Interconstitutive Language-Content Pedagogy**

Authors / Year	Title / Focus	Objective	Methods	Key Findings
Dong (2002)	Biology teachers integrating L2 support	Investigate how teachers integrate L2 support without reducing rigor	Classroom observations; teacher interviews	Culturally responsive teaching enhances ELL learning while maintaining rigor
Markic (2014)	CLIL in diverse science classrooms	Examine collaborative CLIL module design in linguistically diverse settings	Qualitative classroom research	Linguistic diversity becomes a resource; improved inclusiveness and content learning
Houston (1987)	ELDAC project	Assess impact of language integration across curriculum	Large-scale curriculum intervention	Integrated language teaching benefits all learners; requires institutional commitment
Meyliyeva (2025)	English in technical universities	Identify emerging practices for L2 integration in technical fields	Interviews; case study	Technical fields can support L2 learning with innovation despite structural limits
Short (2017)	SIOP Model for ELLs	Describe and evaluate SIOP for content-area teaching	Model analysis + empirical evidence	Improved academic language and comprehension; requires fidelity and PD
Domke & Cerrato (2024)	Meta-review of integration studies	Synthesize findings from 199 studies on language-content integration	Meta-review	Best practices identified; major gaps in teacher preparation and institutional support
Kennedy & Ihle (2012)	Special education and disciplinary language	Examine language demands in special education content teaching	Classroom-based study	Explicit content-language connections and multimodal supports improve accessibility
Revita, I., Ferdinal, F., Oktavianus, O., Asnan, G., & Herwandi, H. (2024)	Bridging the Worlds: Metaphor in Interdisciplinary Contexts	Explain how metaphor functions cognitively and linguistically to link disciplinary knowledge.	Conceptual and theoretical interdisciplinary analysis.	Metaphor acts as a cognitive/linguistic bridge that supports interdisciplinary teaching; enables simultaneous development of disciplinary and language knowledge.
Sastra, G., Haq, M. S., & Handoko, H. (2019)	The Role of Neurolinguistics for Language and Speech Disorders	Show how neurolinguistics integrates language science and clinical content.	Review of neurolinguistic literature and applied cases.	Demonstrates deep interdependence of linguistic and neurological knowledge; supports curricular approaches where language learning and disciplinary content inform each other.

academic language is not additive but rather at the center of content proficiency, especially for English language learners (ELLs) who struggle with the Common Core and the Next Generation Science Standards. Content instruction that does not explicitly work toward building language can potentially exacerbate achievement gaps by rendering disciplinary knowledge inaccessible to vast segments of the student population. This is not merely a question of technical challenge—it reflects more profound structural injustices which put language minority students at a disadvantage in mainstream classrooms.

The studies in Table 3 demonstrate how interconstitutive approaches to language and content instruction respond to the challenges and promote more equitable learning outcomes for language-minority students. Dong (2002) demonstrates that culturally responsive teaching in biology, when combined with second language (L2) support, enhances the academic performance

of English Language Learners (ELLs) without compromising academic rigor, showing the potential for maintaining content complexity while providing language assistance. Similarly, Markic (2014) reveals that in linguistically diverse science classrooms, the integration of Content and Language Integrated Learning (CLIL) transforms linguistic diversity into a resource, improving both inclusiveness and content learning. The ELDAC project (Houston, 1987) further emphasizes that language integration across the curriculum benefits all learners but requires institutional commitment to be effective. In the context of technical fields, Meyliyeva (2025) shows that innovative practices can facilitate L2 learning, even within the structural limitations of these disciplines. Short (2017) highlights that the SIOP model, a well-established method for teaching content to ELLs, improves academic language and comprehension, though it necessitates professional development and fidelity in implementation. Domke and Cerrato

(2024) identify best practices in language-content integration through a meta-review, while also highlighting significant gaps in teacher preparation and institutional support. Kennedy and Ihle (2012) stress the importance of explicit content-language connections and multimodal support in special education, which significantly improve accessibility for students. Moreover, Revita et al. (2024) demonstrate how metaphor can act as a cognitive and linguistic bridge in interdisciplinary contexts, linking disciplinary knowledge with language learning. Finally, Sastra et al. (2019) demonstrate the deep interdependence between neurolinguistics and language learning, supporting curriculum designs that mutually reinforce language and disciplinary content.

Together, these studies affirm that, as seemingly daunting as it may be to localize language support in non-language areas, it is equally profoundly transformative. It calls for a paradigm shift—away from the notion of language support as the lingua franca of language specialists and towards embracing it as everyone's responsibility across the curriculum. It calls for not just pedagogic imagination, but also institutional vision, policy alignment, and infrastructure for professional development.

The integration of language support into non-language curricula is a scary but thrilling reality. The issues, spanning teacher training flaws to unyielding curricula, are real but not insurmountable. Since this section has been illustrated, the majority of studies cite scalable solutions and sustainable models in which placing language development at the core of content instruction is most common. From biology courses and engineering schools to science labs and special education, the mandate is the same: language is at the center of learning, and its integration in teaching disciplines is the foundation for just and effective schooling.

#### IV. DISCUSSION

Before proceeding with the specific review of established theoretical frameworks that grounded this study, the authors introduce the IDLE (Integrated Disciplinary and Linguistic Empowerment) Model as a conceptual synthesis developed as an original contribution to the field, based on the qualitative evidence reviewed. The IDLE Model explicitly positions questions of systemic change with regard to language and content not as separate entities but

as co-constitutive forces.

This model emerges inductively from the recurring patterns identified in the literature on EMI and multilingual higher education, particularly the consistent emphasis on aligning disciplinary knowledge, academic language, and institutional conditions.

It is based on three interrelated domains:

**Foundational Ideas:** This area reinforces the view that language is constitutive of knowledge in itself, while multilingualism should be regarded as an asset in pedagogical terms rather than a liability. It adopts the perspective of Disciplinary Literacy, assuming that each subject involves the mastery of its own distinctive linguistic and epistemological traditions.

These foundational principles reflect a broad scholarly consensus that language is not an auxiliary skill, but a constitutive element in the construction of disciplinary knowledge across fields.

**Pedagogical Practices:** These are the actionable, interdisciplinary strategies for the classroom that help make language visible and teachable. Such practices include explicit language awareness, integrated scaffolding strategies, and the needed collaborative learning structures to ensure shared responsibility.

These practices have emerged consistently in research as key mechanisms whereby students acquire, or are provided with access to, specialist discourses, cognitive tools, and communicative routines of their disciplines.

**Enabling Contexts:** This final domain acknowledges that classroom success is dependent on systemic factors. It requires Institutional Support, such as policy alignment, and sustained Professional Development to overcome ideological barriers like monolingual norms and insufficient teacher preparation.

The literature has long emphasized that even the best-designed language-sensitive pedagogies cannot be effectively implemented without clear institutional policies and ongoing professional development.

Taken together, the three domains provide a structured lens through which the interrelated linguistic, pedagogical, and institutional factors identified across previous studies can be integrated



**Fig. 4. The IDLE Model (Integrated Disciplinary and Linguistic Empowerment Model)**

into a coherent framework.

According to the IDLE Model, the aim of language-sensitive pedagogy is nothing less than the holistic empowerment of students, ensuring that depth in disciplinary knowledge is acquired alongside advanced linguistic capability. This perspective informs our subsequent discussion of established models such as ROAD-MAPPING and Disciplinary Literacy.

Language-sensitive pedagogy has become increasingly prominent as a pedagogical response to the growing linguistic diversity in higher education. It is based on the conviction that language is not a medium for passing disciplinary knowledge but that it is an origin of constitutive forces of the forms in which knowledge is produced, transmitted, and evaluated in all disciplines. This pedagogical approach is in consonance with dual target learning models such as Integrating Content and Language in Higher Education (ICLHE) (Dafouz & Smit, 2020) and the Cognitive Academic Language Learning Approach (CALLA) (Chamot & O'Malley, 1987), which emphasize the integrated learning of subject matter and academic language competence. In this spirit, language is not addressed as an outside support device for content education but as a constitutive aspect of discursive practice.

Dafouz and Smit (2020) offer a compelling model that theorizes the enactment of English-medium and multilingual teaching in six dimensions: English roles, fields of study, (language) management, agents, practices, and internationalisation policies. Most specifically, the model places at its center pedagogical and institutional practices that comprise the manner in which language-sensitive teaching is practiced. By assuming language as both the medium and the message of scholarly practice, their model calls for a holistic approach that incorporates policy, pedagogy, and knowledge production within scholarly disciplines.

At the same time, the disciplinary literacy model outlined by Shanahan and Shanahan (2008) takes this insight further by emphasizing that literacy requirements shift and specialize with education levels. Whereas initial literacy instruction can focus on general decoding or comprehension methods, achievement in more advanced levels of education hinges on students' exposure to specific epistemological, rhetorical, and representational protocols within their domains. As authors pen, "As disciplinary expertise increases, so does the complexity of texts and literacy demands placed on learners." (Shanahan & Shanahan, 2008, p. 48). Regardless of whether they read a proof in math, history texts, or chemistry formulas, students need to learn discipline-specific means of thinking and communicating.

This discipline of literacy is a divergence from the erstwhile dominant byword of Gray (1925) that "every teacher is a reading teacher." While well-meant in its origin, this byword has all too often been interpreted to mean that all teachers should offer generic reading skills regardless of subject. Shanahan and Shanahan (2008) criticize this reading, arguing that general literacy instruction will not adequately prepare students for the rigors of postsecondary education. Instead, they advocate for a less overt principle: "every teacher is a teacher of disciplinary literacy." This definition maintains collective responsibility for literacy but empowers teachers to offer the specific literacy practices relevant to their field, thereby acknowledging the non-transferability of reading and writing methods across disciplines.

The consequences of this shift are revolutionary. Language development is no longer secondary to

knowledge of content—it is inseparable from it. Teachers will have to be able to provide scaffolding for the discursive and linguistic structures that define knowledge in the disciplines, such as argumentation in philosophy, experimental writing in biology, or data visualization in economics. This type of integration, as Dafouz and Smit (2020) argue, has to be backed institutionally by policy, curriculum, and interdisciplinary cooperation. Preservice teacher preparation programs, therefore, must be infused with subject-literacy and language pedagogies designed to enable teachers to make language teachable and visible in their subject matter fields.

Instructional habits can render this vision even more tangible. Two examples are chemistry content-specific note-taking templates, which focus on substance, properties, and reactions, and history source analysis templates, which focus on author, context, and purpose. These examples demonstrate how language-aware habits can be consciously integrated into content teaching. These habits, as noted by Shanahan and Shanahan (2008), enable students to absorb the linguistic routines and forms of reasoning characteristic of their subjects, becoming increasingly independent and academically self-assured.

Briefly, pedagogical origins of language-responsive teaching, as defined by Dafouz and Smit's integrative model and Shanahan and Shanahan's disciplinary literacy framework, require a reconceptualization of language and literacy. No longer isolated skills in their own right, they are now understood as situated and discipline-specific practices mediating access to academic participation and achievement. As Dafouz and Smit (2020, p. 262) contend, "language is not just a vehicle for transmission, but an integral part of knowledge building and scholarly participation." To this end, sound pedagogy in multilingual higher education is to transcend cursory language support to put language at the forefront as a significant, dynamic force in discipline teaching.

## V. CONCLUSION

For language-sensitive pedagogy to be successfully applied in multilingual higher education, universities must seek systemic change at both the structural and classroom levels. One

of the initial steps would be to integrate language itself into curriculum design, thereby ensuring that language becomes an integral, teachable component of all curricula. Institutional policy must support responsive and inclusive pedagogies that situate multilingualism as a positive, rather than negative, aspect of a student's profile. Alongside, encouraging interdisciplinary collaboration, especially among content-area and language specialists, can help to enable better planning for instruction and establish shared responsibility for students' learning. Discipline-based professional preparation in language demands, as well as translingual pedagogies such as translanguaging, which value and capitalize on students' multilingual repertoires, are equally essential.

Co-teaching models also enable the simultaneous addressing of subject matter and language learning, thereby boosting student motivation and teacher learning. Lastly, centering the language in disciplinary teaching is no longer just pedagogical but a structural and ideological transformation. With the alteration of institutional policy, teacher preparation, and class practice, higher education can better empower all students to participate and thrive in academe regardless of language background.

## ETHICS STATEMENTS

This research did not involve human participants, personal data, or interventions that require ethical approval. The study is a qualitative synthesis of existing research evidence and complies with the ethical standards of academic publishing and the principles of responsible scholarship.

## CREDIT AUTHOR STATEMENT

**Dr. Abdelkader Makhlof:** Conceptualization; Methodology; Investigation; Writing – Original Draft; Writing – Review & Editing; Visualization.

**Dr. Hanane Rabahi:** Conceptualization; Methodology; Validation; Writing – Review & Editing; Supervision.

## DECLARATION OF COMPETING INTERESTS

The authors declare no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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