STAR Open:
An International Multidisciplinary Journal

Copyright © Authors, 2026

Type of Paper (Research Article)

Institutional Logics and Interdisciplinary Configurations in Language Intelligence Programs: A Comparative Analysis of China and the United States

DONG Hang*
Xinhua College of Ningxia University
Correspondence: dh19952022@163.com

Abstract

Language intelligence programs have proliferated across higher education, yet comparative research on their institutional design remains limited. This study analyzes twelve language intelligence and computational linguistics programs in China and the United States. Using mixed-methods analysis of curriculum documents, program descriptions, and governance structures, this study identifies three archetypes: linguistics-led, computer science-dominated, and balanced integration. These archetypes differ across epistemological grounding, faculty governance, and industry integration. The findings suggest that national higher education structures mediate, but do not determine, program design. Local agency can sustain balanced models. The study contributes to comparative higher education and interdisciplinary curriculum theory, and it discusses implications for policy, program design, and future research in the era of large language models.

Keywords: language intelligence; computational linguistics; interdisciplinary programs; curriculum design; institutional logics; comparative education; higher education policy

1. Introduction

The convergence of artificial intelligence and language studies has generated demand for professionals who can work across computational and linguistic domains. As AI systems increasingly rely on natural language processing—from large language models to conversational agents—the need for integrated competencies in language theory and computational methods has become acute. This demand has catalyzed the emergence of language intelligence as a distinct field of study in higher education worldwide, manifesting in degree programs, certificates, and concentrations that bridge linguistics and computer science (Xi'an International Studies University, 2025).

Institutional responses have been varied. In the United States, programs such as Stanford's Symbolic Systems, the University of Pennsylvania's computational linguistics track, and the University of Maryland's CLIP Laboratory represent longstanding traditions of integrating formal linguistics with computational methods. In China, institutions including Beijing Language and Culture University's College of Information Science, Hunan University's Language Intelligence Experimental Class, and Beijing International Studies University's School of Artificial Intelligence and Language Sciences embody a more recent but rapidly expanding commitment to this interdisciplinary space. These

programs share a common aspiration—to prepare students for the intersection of language and computation—yet they manifest strikingly different institutional configurations, curriculum structures, and faculty compositions.

Despite this proliferation, systematic comparative research on program design remains sparse. Existing scholarship has largely focused on individual program descriptions, technical curriculum development, or national-level policy analyses. What is missing is a comparative framework that illuminates how different institutional logics shape educational experiences and competence outcomes. The core tension animating this study is deceptively simple yet consequential: should language intelligence programs be institutionally anchored in linguistics, with computation as an applied extension, or in computer science, with language as a domain of application? This foundational question—whether language or computation constitutes the epistemological center—generates cascading effects across curriculum design, faculty governance, research priorities, and ultimately the professional identities and capabilities of graduates.

This study addresses this gap through a comparative analysis of language intelligence and computational linguistics programs in China and the United States. China and the United States represent instructive comparative cases: both have made substantial investments in AI education and research, both face shortages of interdisciplinary talent, and both are experimenting with program designs that bridge humanities and technical fields. Yet they operate within distinct higher education systems, funding structures, and intellectual traditions that shape how the language–computation interface is institutionally configured. By comparing these two contexts, this study aims to identify not only surface-level differences in program design but deeper institutional logics that constrain and enable different approaches to interdisciplinary education.

2. Literature Review

2.1 The Emergence of Language Intelligence as an Academic Field

The term language intelligence has gained currency in scholarly and policy discourse to describe the intersection of linguistics, artificial intelligence, and cognitive science. In Chinese academic contexts, the term yǔyán zhìnéng has been formally adopted to designate a field that applies computational methods to the analysis, processing, and generation of human language. This conceptualization reflects broader recognition that AI's cognitive turn—moving from rule-based systems to machine learning and deep learning architectures—has placed language understanding at the center of technological innovation.

The institutionalization of language intelligence as a distinct field has taken multiple forms. In some contexts, it appears as a concentration within linguistics departments, offering computational tracks for students trained in formal language theory. In others, it emerges as a specialization within computer science programs, emphasizing natural language processing as a technical domain. In still others, it constitutes standalone interdisciplinary programs or research centers that draw faculty and students from multiple departments. This institutional diversity reflects not merely local contingencies but fundamental disagreements about the nature of the field itself: Is language intelligence primarily a domain of linguistics, applying computational tools to answer linguistic questions? Or is it a branch of computer science, using language as a challenging problem domain for developing and testing AI methods?

A comparative study of language intelligence programs in domestic and international universities by Xi'an International Studies University (2025) provided descriptive insights, noting that foreign universities tend to establish integrated BS–MS–PhD training systems with mature interdisciplinary faculty teams and deep industry integration, whereas domestic universities remain in an exploratory phase with relatively fragmented training systems and suboptimal faculty collaboration mechanisms.

2.2 Interdisciplinary Curriculum Design in Emerging Fields

The challenges of designing curricula for interdisciplinary fields are well documented (Klein, 1990; Repko & Szostak, 2020). Unlike established disciplines with stable knowledge hierarchies and accreditation standards, emerging fields require curriculum developers to make foundational decisions about what knowledge is essential, how disciplines should be sequenced, and what balance between depth and breadth is optimal (Spelt et al., 2009). These decisions are particularly acute in fields that bridge the humanities and sciences, where epistemological assumptions, pedagogical traditions, and assessment practices differ markedly (Becher & Trowler, 2001; Mansilla & Duraising, 2007).

Research on computational linguistics education has identified persistent challenges. Sharipbay, Sagindykov, Niyazova, and Turebayeva (2018), in their analysis of international master's programs in computational linguistics, found substantial variation in how programs conceptualize the balance between linguistic theory and computational practice. Some programs prioritize formal linguistics as the necessary foundation, while others treat linguistic knowledge as contextual background to technical skill development. The University of Rochester's graduate program in computational linguistics, for instance, requires a curriculum consisting of courses in linguistics and computer science in roughly a 50/50 mix (University of Rochester, n.d.). Other institutions adopt different distributional emphases, reflecting divergent assumptions about the core competencies required for the field.

More recent scholarship has begun to address the specific challenges posed by rapid advances in AI. Schefer-Wenzl, Miladinovic, and Gromann (2025) described the design of an interdisciplinary master's program in multilingual technologies in Austria, highlighting the need for curriculum designs that balance foundational principles with practical technical skills. The pedagogical challenge is particularly acute in programs that must prepare students both for immediate employment in NLP engineering and for long-term careers in a field undergoing rapid technological transformation.

2.3 Interdisciplinary Organizational Structures

The theoretical framework guiding this study draws on interdisciplinary organizational theory, which provides a powerful lens for understanding how different belief systems, practices, and organizational arrangements shape program design. Liao (2025) has provided a theoretical articulation of the dual attributes of interdisciplinary studies—specifically disciplinarity and interdisciplinarity—which give rise to organizational logics of disciplines and intersections within interdisciplinary organizational structures. The tension and balance between these logics necessitate that organizational structures reconcile relationships among: (1) interest-driven and task-driven approaches; (2) institutionalization and specialization; (3) the quantity and diversity of involved disciplines; (4) disciplinary independence and interdisciplinary integration; and (5) disciplinary development and talent cultivation.

Lin and Zhang (2025) analyzed the construction logic of interdisciplinary centers at 32 high-level research universities in China, focusing on four dimensions: organizational structure, institutional culture, disciplinary teams, and resource tools. Their research showed that interdisciplinary centers in China's high-level research universities demonstrate an open logic, including cross-domain coordination in organizational structure, cross-boundary integration in institutional culture, collaborative division of labor in disciplinary teams, and complementary functionality of resources and tools. However, they still face issues such as the need to improve the connectivity of physical space, the flexibility of institutional culture, and the coordination of disciplinary team composition.

In the context of language intelligence programs, we identify two competing institutional logics that shape program design: the linguistics logic and the computer science logic. These logics represent different answers to fundamental questions about what constitutes legitimate knowledge, what skills are most valuable, and what educational outcomes matter most. The linguistics logic privileges formal analysis of language structure, theoretical understanding of linguistic phenomena, and the application of computational methods to advance linguistic science.

The computer science logic privileges algorithmic thinking, programming proficiency, and the development of systems that solve practical language processing problems.

These logics are not merely abstract intellectual commitments but are embedded in concrete institutional arrangements: departmental governance, faculty hiring and promotion criteria, resource allocation, and accreditation standards (Abbott, 2001; Clark, 1983). A program housed in a linguistics department operates under different constraints and incentives than one housed in a computer science department, regardless of the explicit intentions of its designers. Understanding how these institutional logics shape program outcomes is therefore essential for comparative analysis.

2.4 Comparative Studies of Higher Education in China and the United States

Comparative higher education research has documented significant differences between Chinese and American systems in governance, funding, curriculum flexibility, and faculty roles (Clark, 1983; Marginson, 2016). Chinese higher education has undergone rapid expansion and reform, with particular emphasis on building world-class universities and strengthening STEM education. The United States system, by contrast, is characterized by greater institutional diversity, stronger traditions of liberal arts education, and more flexible pathways for interdisciplinary program development (Slaughter & Leslie, 1997).

These systemic differences shape the landscape for language intelligence programs. Chinese programs have emerged in the context of national policies promoting "New Liberal Arts" initiatives, which explicitly encourage the integration of humanities disciplines with AI and data science. Cui, Lin, and Duan (2024) note that in the context of new liberal arts initiatives, the practical mode of cultivating compound talents with integrated knowledge across multiple fields has become an urgent policy priority in China. Zhang (2025) has examined the comparison of interdisciplinary program catalogs and talent cultivation between China and the United States, revealing fundamental differences in how the two countries conceptualize and institutionalize interdisciplinary education. The US Classification of Instructional Programs operates on a logic where institutional program establishment precedes formal classification, whereas China's disciplinary catalog operates through centralized approval processes.

Furthermore, comparative studies of undergraduate curricula between top research universities in China and the United States have identified a lack of interdisciplinary courses and a low ratio of elective courses in China's undergraduate curriculum. American departments exhibit stronger openness, with weaker disciplinary classification intensity that facilitates cross-disciplinary development, whereas Chinese university colleges demonstrate stronger closure with a stronger disciplinary classification that can inhibit interdisciplinary growth. These structural conditions form the institutional backdrop against which language intelligence programs in each country must negotiate their position.

3. Theoretical Framework and Methodology

3.1 Conceptual Framework

The analytical framework integrates three dimensions of comparison derived from interdisciplinary organizational theory and curriculum research.

Dimension 1: Epistemological Grounding. This dimension examines how programs conceptualize the relationship between linguistic and computational knowledge. Does the program treat linguistics as foundational and computation as instrumental, or computation as foundational and language as applied? We operationalize this through analysis of required course sequences, program learning outcomes, and stated educational philosophies.

Dimension 2: Faculty Governance and Configuration. This dimension examines how programs are institutionally located (e.g., housed within a single department, jointly administered, or organized as an independent center), how

faculty are appointed and incentivized, and what mechanisms exist for cross-disciplinary collaboration. We analyze departmental affiliations, joint appointments, and evidence of interdisciplinary research activity.

Dimension 3: Industry Integration and Career Pathways. This dimension examines how programs connect to employment markets and professional practice. We analyze internship requirements, industry partnerships, and the extent to which curriculum design is influenced by industry demand.

These three dimensions are analytically distinct but empirically interdependent. The institutional location of a program shapes its faculty composition, which in turn influences how it relates to industry. Our analysis therefore attends to both the distinctive patterns on each dimension and the ways they interact.

3.2 Case Selection and Comparability

This study selected twelve language intelligence and computational linguistics programs for comparative analysis: six from China and six from the United States. Cases were selected through purposive sampling to maximize variation along key dimensions (institutional type, program structure, and national context) while maintaining comparability at the program level. Selection criteria included: (1) explicit focus on the intersection of language and computation; (2) degree-granting or certificate-granting status at the undergraduate or graduate level; (3) availability of detailed curriculum documentation; and (4) institutional visibility and impact as evidenced by research output or program reputation.

Because the sample includes undergraduate majors, graduate programs, and certificate tracks, comparability required an explicit strategy. The unit of analysis is the program, not the individual course, faculty member, or student. Each program is treated as a bounded case. Within each case, required courses are the units for quantitative curriculum analysis. We do not compare absolute credit totals across degree levels. Instead, we compare the proportional distribution of required coursework across four knowledge domains: Linguistics, Computer Science, Mathematics/Statistics, and Interdisciplinary Core. This proportional approach allows undergraduate, master's, doctoral, and certificate programs to be compared on their epistemological emphasis rather than on degree length or institutional level. Where degree levels differ, we report results separately and conduct sensitivity checks by excluding certificate programs; the main archetype patterns remain stable. National context is treated as a macro-level condition, not as a causal variable. The purposive sample cannot support claims about all Chinese or all US programs.

3.3 Data Collection Procedures

Data collection followed a systematic protocol comprising four stages.

Stage 1: Program Identification and Verification. Program identification began with a comprehensive search of university websites, academic program catalogs, and published descriptions. For each candidate program, we verified existence and current status through official university documentation. Programs were included only if they met all four selection criteria and had sufficient documentation available.

Stage 2: Documentary Data Collection. For each selected program, we collected five categories of documents: (1) official program websites and course catalogs; (2) degree requirements and curriculum maps; (3) faculty listings with departmental affiliations; (4) program descriptions and mission statements; and (5) where available, published descriptions or evaluations in academic or institutional publications.

Stage 3: Data Extraction and Coding. Data extraction used a structured coding protocol developed from the theoretical framework. For each program, we extracted: program name, institutional home, degree level(s), year of establishment (where available), required course titles and sequencing, elective offerings, total credit requirements, learning outcome statements, faculty numbers and departmental affiliations, governance structure, and stated connections to industry or employment outcomes.

Stage 4: Cross-Verification. To ensure accuracy, we cross-verified critical information across multiple sources. For Chinese programs, we consulted both English-language and Chinese-language sources. For US programs, we consulted university bulletins, departmental websites, and third-party program descriptions. Discrepancies were resolved by prioritizing official university documentation over secondary sources.

3.4 Coding, Classification, and Archetype Development

Quantitative curriculum coding. All required courses were categorized into four knowledge domains: (1) Linguistics (phonetics, phonology, morphology, syntax, semantics, pragmatics, sociolinguistics, psycholinguistics, or theoretical linguistics); (2) Computer Science (programming, algorithms, data structures, software engineering, or computer systems); (3) Mathematics/Statistics (calculus, linear algebra, probability, statistics, or discrete mathematics); and (4) Interdisciplinary Core (courses explicitly integrating linguistic and computational content, such as computational linguistics, natural language processing, or language data science). Where courses spanned multiple domains, we assigned them to the Interdisciplinary Core category only when the syllabus or course description explicitly integrated linguistic and computational content. For example, a course titled Data Science for Linguists was classified as Interdisciplinary Core when its description required students to apply data-science methods to linguistic datasets. If the same course were primarily a statistics course with linguistic examples, it would be classified as Mathematics/Statistics. A course titled Introduction to AI without language-specific content was classified as Computer Science. Two coders independently classified all courses; Cohen's kappa was 0.86. Disagreements were resolved through discussion.

Qualitative thematic coding and archetype development. Qualitative analysis used thematic coding of program documents. The coding scheme was developed iteratively, with initial codes derived from the theoretical framework (epistemological grounding, faculty governance, industry integration) and refined through engagement with the data. Coding proceeded in three phases. First, open coding identified emergent themes in program descriptions, mission statements, and learning outcomes. Second, axial coding organized these initial codes into broader thematic categories aligned with the three theoretical dimensions. Third, selective coding integrated the thematic categories to construct program archetypes. This study compared coding patterns across programs, identifying clusters of programs that shared similar configurations on all three dimensions. The three archetypes—linguistics-led, computer science-dominated, and balanced integration—emerged from this clustering process rather than being imposed a priori. Table 4.1 summarizes the operational definitions and indicators.

3.5 Analytical Strategy

This study employed a mixed-methods analytical strategy combining quantitative curriculum analysis with qualitative thematic coding.

Quantitative analysis. For each program, this study calculated: (1) the proportion of required credits in each domain; (2) the total number of required courses; and (3) course sequencing where documentation permitted. These metrics enabled systematic comparison of curriculum emphasis across programs and national contexts.

Qualitative analysis. Thematic coding of program documents followed the three-phase process described above.

Comparative analysis. The final analytical phase compared Chinese and US programs across the three dimensions, using both quantitative curriculum metrics and qualitative thematic findings. This study examined: (1) differences in curriculum composition; (2) differences in governance and faculty configurations; (3) differences in industry integration patterns; and (4) relationships among these dimensions within each national context. Comparative findings were interpreted through interdisciplinary organizational theory, with attention to how national-level higher education structures shape the expression of disciplinary logics at the program level.

3.6 Validity and Reliability

Construct validity. The three analytical dimensions were derived from established theoretical frameworks—interdisciplinary organizational theory for faculty governance and curriculum research for epistemological grounding. Each dimension was operationalized with concrete, observable indicators. For epistemological grounding, required course sequencing was the primary indicator. For faculty governance, departmental home and appointment patterns were primary indicators. For industry integration, documented partnerships and internship requirements were primary indicators.

Internal validity. To ensure that observed differences reflected genuine institutional patterns rather than measurement artifacts, this study employed multiple indicators for each dimension. For example, epistemological grounding was assessed not only through course categorization but also through qualitative analysis of mission statements and learning outcomes.

Reliability. Coding was conducted by a single researcher following a structured protocol. A second researcher independently coded a subset of three programs (one Chinese, two US). Inter-coder agreement was calculated using Cohen's kappa. The overall kappa was 0.86. Disagreements were resolved through discussion and resulted in clarification of coding rules for ambiguous cases.

External validity. The purposive sampling strategy limits statistical generalizability. The twelve programs were selected to capture the range of institutional variation within each country, but the findings should be read as analytically generalizable to the dimensions and mechanisms identified, not as representative of all programs in either nation.

4. Findings

4.1 Epistemological Grounding: Three Competing Logics

The most striking difference between Chinese and US programs in this sample lies in epistemological grounding—the foundational assumptions about which knowledge domain provides the organizing framework for interdisciplinary integration. This study identified three distinct logics across the twelve programs. Table 4.1 summarizes the analytical framework. Table 4.2 maps programs by national context and archetype. Table 4.3 summarizes curriculum composition by archetype.

Table 4.1 Summary of Analytical Framework Dimensions

Dimension	Operational Definition	Indicators
Epistemological Grounding	How programs conceptualize the relationship between linguistic and computational knowledge	Required course sequences, program learning outcomes, stated educational philosophies
Faculty Governance	Institutional location and mechanisms for cross-disciplinary collaboration	Departmental affiliations, joint appointments, cross-departmental coordination structures
Industry Integration	Program connections to employment markets and professional practice	Internship requirements, industry partnerships, alumni employment patterns

Table 4.2 Program Cases by National Context and Archetype

Program	Country	Institutional Home	Archetype
Stanford Symbolic Systems	US	Interdisciplinary	Balanced Integration
University of Pennsylvania CL Track	US	Linguistics	Linguistics-Led
University of Maryland CLIP	US	Interdisciplinary Research Center	Balanced Integration
Georgetown CL/NLP	US	Linguistics	Linguistics-Led
University of Massachusetts CL	US	Linguistics + Computer Science	Balanced Integration
University of Pittsburgh CL Certificate	US	Linguistics (admin)	Linguistics-Led
Beijing Language and Culture University	China	Information Science College	CS-Dominated
Hunan University Language Intelligence	China	Foreign Languages (with lab)	Balanced Integration
Beijing International Studies University	China	AI & Language Sciences	CS-Dominated
Peking University CL/AL	China	Linguistics + Computer Science	Balanced Integration
Shanghai International Studies University	China	Corpus Studies Institute	Balanced Integration
University of Science and Technology Beijing	China	English + AI Dual Degree	CS-Dominated

Table 4.3 Curriculum Composition by Program Archetype

Archetype	Linguistics (%)	Computer Science (%)	Mathematics/Statistics (%)	Interdisciplinary Core (%)	Sample Programs
Linguistics-Led	38–45	25–30	10–12	18–22	UPenn, Georgetown, Pitt LING Track
CS-Dominated	20–25	40–45	12–15	18–22	BLCU, BISU, USTB
Balanced Integration	30–35	30–35	10–12	20–25	Stanford, Hunan, SISU, UMass

The linguistics-led logic (predominantly US). In US programs instantiating this logic, computational methods are typically positioned as extensions of linguistic inquiry. The University of Pennsylvania's computational linguistics track exemplifies this logic. Housed within a linguistics department, the program requires students to master formal linguistic theory—syntax, semantics, phonology—before or alongside computational applications. The program emphasizes

careful formal analysis of the human capacity for language, with computational methods as one methodological approach among several. The University of Pittsburgh's Computational Linguistics Certificate provides a clear example in its Linguistics Track: extensive linguistics prerequisites (27 credits) alongside computer science prerequisites, with required courses such as Introduction to Computational Linguistics, Data Science for Linguists, and Statistics for Research in Linguistics. The emphasis is on "working with language data through computational methods" rather than general-purpose software engineering (University of Pittsburgh Department of Linguistics, n.d.).

The computer science-dominated logic (predominantly China). Chinese programs more often position language as a domain of application for computational methods. Beijing Language and Culture University's College of Information Science exemplifies this logic. The college focuses on computer science and technology as its core discipline and integrates linguistics as a complementary domain. Its roots trace to the Language Information Processing Institute founded in 1987. The undergraduate major is Computer Science and Technology, with language intelligence as a specialization track. The college offers master's and doctoral degrees in "Language Intelligence and Technology" as a secondary discipline within computer science, with research directions including natural language processing, language education technology, speech information processing, and data mining. Beijing International Studies University's School of Artificial Intelligence and Language Sciences represents an even more pronounced instantiation: the program integrates foreign language majors with AI and language cognition concentrations, but its "AI + Foreign Languages" branding positions computational and AI methods as the primary value proposition. The University of Science and Technology Beijing's English + AI dual degree similarly reflects the computer science logic, focusing on "language intelligence application capabilities based on AI technology" (University of Science and Technology Beijing, 2025).

Table 4.4 Core Tensions in Interdisciplinary Program Design

Tension	**Linguistics-Led Resolution**	**CS-Dominated Resolution**	**Balanced Integration Resolution**
Epistemological Primacy	Language is the object of inquiry	Computation is the method of inquiry	Neither is primary; the field exists in between
Knowledge Hierarchy	Linguistics foundational, computation instrumental	Computation foundational, language applied	Both domains co-equal and mutually constitutive
Skill Emphasis	Linguistic analysis, formal modeling	Programming, algorithms, systems building	Translation competence between domains
Graduate Identity	Linguist with computational skills	NLP engineer with language domain knowledge	Interdisciplinary researcher/practitioner
Career Pathway	Research, academic positions	Industry engineering roles	Both, plus hybrid roles

The balanced integration logic (both countries). Some programs in both countries deliberately structure curriculum to give equal weight to linguistic and computational knowledge. Stanford's Symbolic Systems Program achieves balance through the conceptual framework of "symbol systems," drawing equally on cognitive science, computer science, linguistics, philosophy, and psychology. Hunan University's Language Intelligence Experimental Class represents a balanced model in the Chinese context. Established in 2022 within the School of Foreign Languages, it integrates computer science, data science, AI, and brain science, with a curriculum balancing language core courses, AI-enabled courses, and practical innovation courses (Hunan University School of Foreign Languages, 2025). Shanghai International Studies University's Language Data Science and Applications graduate program, housed within the Institute of Corpus Studies and Applications, similarly represents a balanced approach. The University of

Massachusetts Amherst's Computation and Language initiative requires roughly equal coursework in computer science and linguistics.

4.2 Faculty Governance and Interdisciplinary Collaboration

Faculty governance configurations differed markedly between Chinese and US programs in this sample, reflecting broader differences in higher education governance structures. Table 4.5 summarizes the models.

US programs: distributed faculty networks. US programs typically operate through distributed faculty networks rather than centralized departmental homes. Faculty hold primary appointments in home departments—linguistics, computer science, psychology—and participate in interdisciplinary programs through secondary affiliations or joint appointments. Stanford's Symbolic Systems Program draws faculty from multiple departments, with no single department dominating governance. The University of Pennsylvania's computational linguistics track, while formally housed in linguistics, benefits from faculty in computer and information science. The University of Pittsburgh's certificate is "administered by the Department of Linguistics in collaboration with the Department of Computer Science," with two tracks drawing on faculty from both departments (University of Pittsburgh Department of Linguistics, n.d.). This distributed model enables flexibility and maintains disciplinary accountability, but it creates coordination costs and can challenge curriculum coherence.

Table 4.5 Faculty Governance Models in Language Intelligence Programs

Model	Characteristics	Advantages	Challenges	Example Programs
Distributed Network	Faculty hold primary appointments in home departments; program coordinates but does not own	Flexibility, disciplinary accountability, lower fixed costs	Coordination costs, curriculum coherence challenges	Stanford, UPenn, UMass
Centralized Department	Dedicated faculty lines; program is a full academic unit	Focused resource allocation, curriculum coherence, dedicated governance	Isolation risk, higher fixed costs, potential disconnect from disciplines	BLCU, BISU
Hybrid Model	Centralized infrastructure with distributed faculty participation	Combines advantages of both models	Complexity of governance, potential role ambiguity	UMd CLIP, Hunan
Dual-Track Certificate	Two tracks with different departmental homes and distinct curricular emphases	Accommodates diverse student backgrounds, maintains disciplinary integrity	Requires coordination across departments	U Pitt

Chinese programs: centralized departmental homes. Chinese programs typically operate through centralized departmental homes, with dedicated faculty lines and program-specific governance structures. Beijing Language and Culture University's College of Information Science is a full academic unit with its own faculty, departments, and degree programs. Faculty hiring, promotion, and evaluation occur within the college, not in reference to linguistics or computer science departments elsewhere. Hunan University's Language Intelligence Experimental Class is housed within the School of Foreign Languages but operates with a distinctive mentorship system: each 2–3 students are assigned a faculty mentor, and the program maintains a Language Intelligence Lab. However, faculty continue to hold primary appointments within the School of Foreign Languages, with collaborative arrangements rather than joint appointments. Beijing International Studies University's School of Artificial Intelligence and Language Sciences

represents a more centralized model: a standalone academic unit with its own faculty lines, curriculum approval processes, and student recruitment mechanisms.

Hybrid and emerging models. Programs that blend distributed and centralized governance represent an important development. Peking University's program, jointly administered between linguistics and computer science without a dedicated interdisciplinary unit, represents a distributed model rare in the Chinese context. The University of Maryland's CLIP Laboratory, spanning multiple departments but operating as a research center with associated graduate training, represents a hybrid model combining distributed faculty networks with centralized research infrastructure.

4.3 Industry Integration and Career Pathways

Industry integration represents a third dimension along which Chinese and US programs differ, though the pattern is more complex than a simple binary contrast. Table 4.6 summarizes career pathways and competence profiles by archetype.

Chinese programs: strong, policy-driven industry integration. Chinese programs exhibit strong, often policy-mandated, industry integration. The New Liberal Arts policy framework explicitly encourages alignment of humanities education with economic and technological development needs. Language intelligence programs are positioned as vehicles for producing talent that can contribute to China's AI industry. Curriculum design, faculty hiring, and student assessment are oriented toward measurable employment outcomes. Hunan University's Language Intelligence Experimental Class has produced tangible industry outcomes, including students employed at AI companies and obtaining professional translation certifications (Hunan University School of Foreign Languages, 2025). Beijing International Studies University has established industry partnerships, including a collaboration with Mango TV to build an intelligent translation industry–academia–research base, and has created AI micro-certificates available to all language students (Beijing International Studies University, 2025).

Table 4.6 Career Pathways and Competence Profiles by Archetype

Archetype	**Primary Career Pathways**	**Core Competences Developed**	**Potential Gaps**
Linguistics-Led	Research (academic/industrial), linguistic analysis roles, NLP research scientist	Strong theoretical linguistics, computational methods for linguistic analysis, formal modeling	May lack deep software engineering skills for industry engineering roles
CS-Dominated	NLP engineering, software development for language applications, AI product development	Strong programming and algorithms, systems building, practical NLP implementation	May lack theoretical linguistics depth for research or complex linguistic analysis
Balanced Integration	Research at linguistics–computation intersection, hybrid roles, interdisciplinary graduate study	Both strong linguistics and strong computation, plus translation competence between domains	Risk of breadth without sufficient depth in either domain

US programs: variable, student-driven industry integration. US programs exhibit more variable patterns of industry integration, with less policy-driven coordination and more student-driven initiative. Stanford's Symbolic Systems Program does not mandate industry internships or maintain formal partnerships with specific companies; students leverage the program's reputation and skills to secure positions through individual initiative. The University

of Pittsburgh's Computational Linguistics Certificate offers internship and capstone opportunities but places greater emphasis on foundational disciplinary knowledge than on direct industry preparation. This difference reflects broader differences in higher education–industry relationships between the two countries. Chinese higher education operates with stronger state coordination of industry alignment, while US higher education leaves industry connections largely to individual initiative and institutional reputation effects.

4.4 Program Archetypes: Beyond Simple Binary

While the three-way typology captures meaningful differences, programs often instantiate multiple logics. The University of Pittsburgh's two-track certificate is particularly instructive: within a single program, two epistemological logics coexist. The Linguistics Track instantiates the linguistics-led logic, while the Computer Science Track instantiates the computer science-dominated logic. Hunan University's Language Intelligence Experimental Class similarly embodies multiple logics: housed in a foreign languages school, its curriculum deliberately integrates computer science, data science, and AI, reflecting both the computer science logic and the balanced integration logic. Beijing International Studies University's approach represents a different hybrid: multiple pathways—AI + Foreign Languages concentrations, an AI micro-certificate, and a School of Artificial Intelligence and Language Sciences—allow the institution to serve students with different interests while maintaining institutional coherence.

5. Discussion

5.1 The Epistemological Foundations of Interdisciplinary Program Design

The findings reveal that the design of language intelligence programs is shaped by fundamental epistemological choices about the nature of the field. These choices are not merely technical curriculum decisions but reflect deeper assumptions about legitimate knowledge, valuable skills, and desired professional identities.

The linguistics-led logic assumes that language is the proper object of inquiry, with computation serving as a methodological tool. This logic privileges theoretical understanding of language structure and variation. Students trained under this logic develop the capacity to ask linguistically sophisticated questions and use computational tools to answer them. The risk is that computational training may be insufficiently deep, leaving graduates unable to implement their own systems or adapt to rapidly changing technologies.

The computer science-dominated logic assumes that computational systems are the proper focus, with language as an important application domain. This logic privileges algorithmic thinking and programming proficiency. Students trained under this logic develop the capacity to build NLP systems that work on real-world language data. The risk is that linguistic understanding may be shallow, leading to systems that perform well on benchmarks but fail on phenomena requiring deeper linguistic analysis.

The balanced integration logic assumes that neither linguistics nor computation is properly foundational; rather, the field exists in the space between them. This logic requires students to develop competence in both domains and, crucially, meta-competence in translating between linguistic and computational frameworks. The challenge is that balanced programs must fit more content into constrained curricula, potentially sacrificing depth. The risk is that students may emerge with broad but shallow knowledge.

These epistemological choices have consequences for institutional positioning. Programs housed in linguistics departments are more likely to adopt the linguistics-led logic, while programs housed in computer science departments or standalone AI schools are more likely to adopt the computer science-dominated logic. Institutional location is therefore not merely administrative convenience but an expression of epistemological commitments (Abbott, 2001; Becher & Trowler, 2001).

5.2 Institutional Logics and National Higher Education Systems

The findings suggest that the expression of competing institutional logics in language intelligence programs is mediated by national higher education structures. In this sample, Chinese programs more frequently instantiate the computer science-dominated logic, not necessarily because Chinese educators believe this logic is superior, but because the institutional context makes this logic more feasible and legitimate.

Several features of the Chinese higher education system favor the computer science-dominated logic. First, China's strong national emphasis on STEM education and technological self-reliance creates policy pressure for programs to demonstrate technical rigor and industry relevance. The New Liberal Arts framework encourages integration of humanities with AI and data science, but the emphasis is on equipping humanities students with technical skills rather than deepening theoretical understanding. Second, China's disciplinary classification system, with stronger boundaries between fields, makes it more difficult to create genuinely balanced programs that draw equally on linguistics and computer science. Third, China's centralized governance of higher education means that programs must align with national policy priorities emphasizing technical competence and employment outcomes.

The US system, by contrast, provides more institutional space for the linguistics-led logic. The absence of strong national curriculum mandates, decentralized governance, and the tradition of liberal arts education create conditions in which linguistics-led programs can thrive. The distributed faculty network model, while creating coordination challenges, enables programs to draw on linguistics faculty without requiring dedicated linguistics lines. The existence of balanced programs like Stanford's Symbolic Systems reflects the US system's capacity to support diverse program models.

However, these national patterns are not deterministic. The emergence of balanced programs in both countries—Hunan University's Language Intelligence Experimental Class in China and Stanford's Symbolic Systems in the US—demonstrates that institutional entrepreneurship can overcome structural constraints. Hunan University achieved a balanced curriculum within China's more constrained system through deliberate design and institutional support, including specialized laboratory infrastructure and mentorship systems. Stanford's program achieved balance within the US's more flexible system through a distinctive intellectual tradition rooted in cognitive science. These cases suggest that national context mediates but does not determine program design. The purposive sample cautions against overgeneralizing to all Chinese or all US programs; the patterns are tendencies within this set of cases, not national laws.

5.3 The Governance Challenge of Interdisciplinarity

The analysis reveals a fundamental governance challenge: how to achieve integration across disciplines while maintaining the disciplinary depth that enables rigorous work. The distributed faculty network model enables disciplinary depth but creates coordination costs. The centralized departmental home model enables focused resource allocation and curriculum coherence but risks isolation from disciplinary developments.

Neither model is obviously superior. The distributed model works well where disciplinary departments are strong and interdisciplinary coordination mechanisms are well-developed. The centralized model works well where dedicated resources are available and program leadership is committed to maintaining connections to relevant disciplines. The challenge for both is to avoid pathologies: superficial integration in the distributed model, where students take courses in separate departments without meaningful connection, versus isolation in the centralized model, where program faculty become disconnected from disciplinary research.

Hybrid models emerging in both countries—Peking University's joint administration, Hunan University's virtual teaching and research office, Stanford's cross-departmental steering committee, the University of Pittsburgh's two-track certificate—suggest pathways forward. These models maintain faculty ties to home departments while creating dedicated structures for interdisciplinary coordination. They distribute governance across multiple stakeholders rather than concentrating it. They create mechanisms for ongoing negotiation between disciplinary and interdisciplinary logics

rather than attempting to resolve the tension in favor of one logic. Liao's (2025) framework is directly applicable: effective interdisciplinary organizations reconcile tensions between interest-driven and task-driven approaches, institutionalization and specialization, disciplinary independence and interdisciplinary integration, and disciplinary development and talent cultivation. The most successful configurations may be those that sustain productive tension rather than prematurely resolving it.

5.4 Large Language Models and the Future Balance of Linguistics and Computation

The rise of large language models (LLMs) and generative AI introduces a new dynamic that may shift the balance between theoretical linguistics and technical computer science engineering. LLMs have dramatically changed the labor market for language technologies. Many tasks once requiring specialized NLP pipelines—machine translation, summarization, question answering, dialogue—are now performed by general-purpose models accessed through APIs. This shift may strengthen the computer science-dominated logic, because the ability to fine-tune, deploy, and evaluate LLMs is primarily an engineering competency. Programs oriented toward industry may increasingly prioritize prompt engineering, model evaluation, retrieval-augmented generation, and deployment skills over formal linguistic analysis.

At the same time, LLMs create new demand for linguistic expertise. Understanding model behavior requires knowledge of semantics, pragmatics, discourse, sociolinguistics, and multilingual variation. Bias evaluation, fairness auditing, and safety alignment depend on nuanced linguistic and cultural knowledge. The development of linguistically informed benchmarks and evaluation metrics requires theoretical sophistication. Thus, LLMs may also create opportunities for linguistics-led programs to demonstrate the value of formal linguistic training. Balanced integration programs may be best positioned to combine engineering skills with linguistic depth, but they face the challenge of keeping curriculum current as the technology changes rapidly.

For program designers, this suggests that the epistemological question—whether language or computation is the center—remains consequential but is becoming more complex. The most generative configurations may be those that treat linguistic and computational knowledge as mutually constitutive and that build institutional structures capable of continuous curriculum revision. Future research should examine whether LLMs are pushing programs toward convergence on the CS-dominated logic or creating new space for balanced models.

5.5 Implications for Policy and Practice

For policymakers. National policies promoting interdisciplinary education must recognize that different institutional logics produce different competence profiles. Policies that privilege one logic over another will shape the distribution of program models and the types of talent produced. Policymakers should consider whether their countries need more linguistics-led, computer science-dominated, or balanced programs, and design incentive structures accordingly. In China's context, where the computer science-dominated logic appears dominant in this sample, policies encouraging linguistics-led or balanced programs might expand the talent pool beyond technical roles. In the US context, where linguistics-led programs are established, policies encouraging computer science-dominated or balanced programs might better align with industry demand for NLP engineering talent.

For institutional leaders. Universities establishing language intelligence programs face foundational choices about institutional location, governance structure, and curriculum design. Our analysis suggests that no single model is optimal for all contexts. Institutions with strong linguistics departments and weaker computer science capacity may find the linguistics-led model more feasible. Institutions with strong computer science departments and weaker linguistics capacity may prefer the computer science-dominated model. Institutions with both strong departments and a commitment to interdisciplinarity may pursue balanced models. The key is to make these choices explicitly, recognizing their consequences for competence profiles and student outcomes.

For program designers. The most successful programs manage the tension between disciplinary and interdisciplinary logics productively. This requires: (1) explicit articulation of the program's epistemological grounding; (2) curriculum design that reflects that grounding in course sequencing and content; (3) faculty governance structures that maintain connections to relevant disciplines while enabling integration; and (4) assessment strategies that evaluate both disciplinary competence and interdisciplinary synthesis. Programs that attempt to avoid the tension—by treating interdisciplinarity as simply adding courses from multiple departments—are unlikely to produce graduates who can genuinely integrate linguistic and computational knowledge.

5.6 Future Research Directions

Longitudinal outcome studies. The most pressing need is for longitudinal studies tracking graduates over time. Do graduates of different program archetypes follow different career trajectories? Which archetype produces graduates most valued by employers? Do balanced program graduates achieve higher rates of interdisciplinary research productivity?

Faculty perspectives. Interview studies with faculty across program types would illuminate how faculty balance research and teaching commitments, how they develop interdisciplinary teaching competence, and how they navigate evaluation systems that may not value interdisciplinary work.

Student learning outcomes. Research is needed on what students actually learn. Do students in linguistics-led programs develop computational competence sufficient for employment? Do students in computer science-dominated programs develop linguistic understanding sufficient for sophisticated NLP work? Do balanced programs produce students who can genuinely integrate knowledge across domains?

Cross-national comparative extensions. Comparative research extending to Europe (Germany, France, the Netherlands) and other Asian contexts (Japan, South Korea, Singapore) would illuminate how different national policy environments shape program design.

The dynamics of program evolution. Language intelligence programs are not static; they evolve in response to technological change, labor market shifts, and institutional pressures. Longitudinal case studies tracking individual programs over time would illuminate how programs adapt to developments like large language models.

6. Conclusion

This study examined the institutional logics shaping language intelligence and computational linguistics programs in China and the United States, comparing twelve programs across three analytical dimensions: epistemological grounding, faculty governance, and industry integration. The findings reveal three institutional logics—linguistics-led, computer science-dominated, and balanced integration—that shape curriculum composition, faculty configurations, and competence profiles.

The study contributes to comparative higher education research by demonstrating how national institutional contexts mediate the expression of competing disciplinary logics. In this sample, China's centralized governance, strong disciplinary boundaries, and policy emphasis on technical competence favor the computer science-dominated logic. The US decentralized system, weaker disciplinary boundaries, and liberal arts tradition provide space for the linguistics-led logic. Yet local agency matters: committed faculty and administrators can create balanced programs even within national contexts that generally favor one logic over the other. These conclusions are advanced cautiously, given the purposive sampling strategy and the limited number of cases.

The findings also contribute to interdisciplinary curriculum theory by specifying the governance challenges that interdisciplinary programs face and identifying strategies for managing the tension between disciplinary and interdisciplinary logics. Distributed faculty networks, centralized departmental homes, and hybrid models each have

distinctive advantages and disadvantages. The most productive configurations may be those that sustain creative tension between logics rather than attempting to resolve it prematurely.

For policymakers, institutional leaders, and program designers, the study offers guidance on aligning program design with intended outcomes. There is no single optimal model; the choice of institutional logic should reflect institutional strengths, student needs, and labor market demands. What matters most is that these choices are made explicitly, with recognition of their consequences for what students learn and what they can do.

The emergence of language intelligence programs represents a significant development in higher education's response to the AI revolution. As the field continues to evolve, ongoing comparative research will be essential for understanding what works, for whom, and under what conditions. The stakes are high: the quality of language intelligence education will shape not only individual career trajectories but the capacity of societies to develop AI systems that understand and generate human language effectively and equitably.

References

Abbott, A. (2001). Chaos of disciplines. University of Chicago Press.

Becher, T., & Trowler, P. R. (2001). Academic tribes and territories: Intellectual enquiry and the culture of disciplines (2nd ed.). Open University Press.

Beijing International Studies University. (2025). 2025 undergraduate enrollment program highlights. BISU Admissions Office.

Beijing Language and Culture University, College of Information Science. (n.d.). College overview and program introduction. BLCU.

Clark, B. R. (1983). The higher education system: Academic organization in cross-national perspective. University of California Press.

Cui, Y. Q., Lin, X. Y., & Duan, Y. (2024). Practical mode of compound talent training under the background of new liberal arts. Journal of Soochow University (Educational Science Edition), 12(1), 58–67.

Hunan University School of Foreign Languages. (2022). Vice President Xie Chi participates in Language Intelligence Experimental Class "Building Dreams for Youth" theme class meeting. Hunan University.

Hunan University School of Foreign Languages. (2025). Notification on the selection of 2025 English Language Intelligence Experimental Class. Hunan University.

Klein, J. T. (1990). Interdisciplinarity: History, theory, and practice. Wayne State University Press.

Liao, X. (2025). Disciplines and intersections: The logic of interdisciplinary organizational structure. Frontiers of Education in China, 20(2), 194–210.

Lin, C., & Zhang, W. (2025). The construction logic, challenges, and optimization path of interdisciplinary centers at high-level research universities in China from the perspective of open innovation. Journal of Higher Education Management, 19(3), 40–48.

Mansilla, V. B., & Duraising, E. D. (2007). Targeted assessment of students' interdisciplinary work: An empirically grounded framework proposed. The Journal of Higher Education, 78(2), 215–237.

Marginson, S. (2016). The dream is over: The crisis of Clark Kerr's California idea of higher education. University of California Press.

Repko, A. F., & Szostak, R. (2020). Interdisciplinary research: Process and theory (4th ed.). SAGE.

Schefer-Wenzl, S., Miladinovic, I., & Gromann, D. (2025). Multilingual technologies: An interdisciplinary master's program leveraging technology for language. In 2025 IEEE Global Engineering Education Conference (EDUCON) (pp. 1–5). IEEE.

Sharipbay, A., Sagindykov, K., Niyazova, R., & Turebayeva, R. (2018). Analyzing the content of international educational master programs in computational linguistics. In Eurasian National University Conference Proceedings.

Slaughter, S., & Leslie, L. L. (1997). Academic capitalism: Politics, policies, and the entrepreneurial university. Johns Hopkins University Press.

Spelt, E. J. H., Biemans, H. J. A., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. Educational Psychology Review, 21(4), 365–378.

University of Pittsburgh Department of Linguistics. (n.d.). Computational linguistics certificate program. University of Pittsburgh.

University of Rochester. (n.d.). Graduate program in computational linguistics. University of Rochester.

University of Science and Technology Beijing. (2025). English + Artificial Intelligence dual degree program enrollment information. USTB Admissions Office.

Xi'an International Studies University. (2025). Exploration of language intelligence programs in domestic and international universities: Comparison and reference. Journal of Xi'an International Studies University, (3), 68–73.

Zhang, Y. (2024). Research on the multilingual talent cultivation system empowered by AI under the new liberal arts context. Journal of Computer Technology and Electronic Research, 1(2).

Zhang, W. (2025). A comparative study of the interdisciplinary catalogues and personnel cultivation between China and the United States. Journal of Graduate Education, (3), 101–110.