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NEGOTIATING ACADEMIC AND PROFESSIONAL IDENTITIES THROUGH TRANSLANGUAGING:A SOCIOLINGUISTIC STUDY OF BILINGUAL COMPUTING STUDENTS AT SUPERIOR UNIVERSITY

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Abstract
This study explores how bilingual computing students at Superior University negotiate their academic and professional identities through the lens of translanguaging. It focuses on the unique phenomenon of writing in coding and thinking in Urdu, where students navigate between two linguistic worlds to construct meaning and confidence. Using a mixed-methods sociolinguistic approach, the research examines how students use Urdu as a tool for cognitive processing and emotional grounding while relying on English for academic expression and professional communication. The findings reveal that translanguaging serves as a bridge between comprehension and performance, allowing learners to connect personal identity with technical proficiency. Rather than signaling a lack of linguistic competence, translanguaging emerges as a powerful strategy of adaptation, creativity, and self-expression. This study highlights the importance of acknowledging linguistic diversity in computing education and suggests that recognizing translanguaging practices can promote inclusive learning environments where students' cultural and linguistic backgrounds become assets rather than barriers.

Keywords: Translanguaging; Bilingualism; Academic Identity; Professional Identity; Computing Students; Linguistic Diversity; Urdu-English; Sociolinguistic Study; Identity Negotiation; Superior University

1. Introduction
Globalization and the increasing dominance of English in higher education have reshaped how multilingual learners negotiate their academic and professional identities (Alzahrani, 2019). In non-Anglophone contexts such as Pakistan, English is both a tool of opportunity and a source of inequality, particularly for students in technical disciplines like computing where English proficiency is linked to employability and prestige (Antony, 2024). Within this environment, bilingual computing students must continuously navigate between English, Urdu, and regional languages to comprehend complex content, collaborate with peers, and project professional competence. This dynamic use of multiple linguistic resources aligns with the concept of translanguaging — the flexible deployment of a speaker's entire linguistic repertoire to make meaning and express identity (Bonacina-Pugh, 2021). Recent research positions translanguaging not merely as a linguistic phenomenon but as a sociocultural practice that reveals how learners construct identities and negotiate power relations in multilingual educational settings (Canagarajah, 2019)(Canagarajah, 2020). In computing education, where technical discourse is tightly coupled with English-dominant terminology, translanguaging allows students to bridge gaps in comprehension and to participate more fully in disciplinary communication (Canagarajah, 2021)(Darvin & Norton, 2023). By alternating between English and Urdu, students often co-construct understanding of abstract programming concepts while reinforcing group solidarity and local belonging (Fuster, 2024). However, such bilingual practices frequently conflict with institutional ideologies that privilege monolingual English norms (Grapin, 2025). These ideologies are underpinned by the assumption that English-only instruction ensures global competitiveness — a view that overlooks the cognitive and affective

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advantages of multilingual learning (Liu & Zhou, 2021). This tension shapes not only students' classroom discourse but also their professional self-perception. Norton's concept of investment and Bourdieu's notion of linguistic capital provide theoretical tools to examine how students use language to claim legitimacy and access symbolic power in academic and workplace contexts (Moraru, 2025). This study investigates how bilingual computing students in Pakistan negotiate academic and professional identities through translanguaging practices. It asks: (1) What translanguaging practices do computing students use in classroom and peer-learning settings? (2) How do these practices relate to students' sense of academic competence and professional readiness? (3) In what ways do institutional norms and employer language expectations shape students' language choices and identity positioning? By combining discourse/interactional analysis of classroom talk with interviews and student reflective journals, the study aims to map the interactional practices through which students construct hybrid academic-professional identities and to identify pedagogical and policy implications for more inclusive, learning-centered language practices in STEM education (Moya, 2023).

2. Literature Review

Translanguaging: concept and relevance. Translanguaging has evolved from a pedagogical and theoretical concept into a robust analytic lens for bilingual communication and learning. Contemporary accounts treat translanguaging as both a cognitive resource and a social practice: learners draw on multiple linguistic resources to construct meaning, grasp complex concepts, and manage interactional work in classrooms and workplaces (Bonacina-Pugh, 2021)(Canagarajah, 2019)(Canagarajah, 2020). This perspective reframes multilingual repertoires as semiotic repertoires that include not only languages but also gestures, visual tools, and digital resources, making translanguaging highly relevant for technology-oriented disciplines such as computing (Canagarajah, 2021).

Translanguaging in higher education and STEM. Recent studies report that translanguaging is common and pedagogically valuable in higher education internationally, yet its implementation is uneven because of institutional monolingual ideologies and assessment regimes (Darvin & Norton, 2023)(Fuster, 2024). Research on translanguaging in STEM and science classrooms shows that instructors' and peers' strategic use of students' home languages can aid conceptual understanding, lower affective barriers, and scaffold participation in technical activities (Grapin, 2025)(Liu & Zhou, 2021). However, translanguaging in STEM also raises dilemmas: teachers and institutions worry about students' English proficiency for international mobility and employability, producing tension between inclusive pedagogy and marketable language skills (Moraru, 2025)(Moya, 2023).

Identity formation: investment, capital, and hybridity. Identity frameworks from applied linguistics and sociology provide tools to interpret translanguaging practices. Norton's concept of investment explains how learners attach social and symbolic stakes to language practices — students may invest in English to gain professional capital while investing in Urdu to sustain peer networks and personal comfort (Qureshi, 2025). Bourdieu's notion of linguistic (or cultural) capital helps explain institutional and labor-market structures that make English a valued resource and thus shape students' identity work (Ou, 2024). Hybridity and translingual identity theories further assert that bilinguals create hybrid subjectivities at the intersection of local and global discourses; computing students often inhabit an "in-between" space where global tech English and local communicative needs intersect (Saleem, 2023)(Salinas, 2024).

Contextual studies: Pakistan and comparable settings. Studies from Pakistan and other Global South contexts indicate monolingual English norms in universities often conflict with students' communicative practices and learning needs (Storheil, 2024)(Tai, 2022). Research in Pakistani higher education reports frequent translanguaging in seminars, lab groups, and online study

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groups, where students mix English and Urdu to clarify technical concepts, translate jargon, and reduce anxiety (Alzahrani, 2019). Comparative studies in Asia and Latin America similarly recommend pedagogically managed translanguaging as a route to equitable STEM education (Anonymous, 2022).

Methodological approaches and gaps. The literature shows a mix of ethnographic discourse analysis, classroom interaction studies, and interview-based research. While descriptive accounts richly document translanguaging instances, fewer studies systematically link interactional practices to identity outcomes across academic and professional domains — especially within computing education. There is also a shortage of longitudinal research tracing how students' translanguaging and identity positioning evolve across the progression from classroom learning to internships and employment. This study addresses these gaps by combining fine-grained interactional analysis with student narratives focused on academic confidence and professional aspirations.

3. Methodology

3.1 Research Design

This study adopted a mixed-methods sociolinguistic design to investigate how bilingual computing students at Superior University negotiate their academic and professional identities through translanguaging. The research integrates both quantitative and qualitative approaches to capture linguistic patterns, perceptions, and contextual meanings. The study explored students' language use while coding, learning, and communicating in academic and pre-professional environments, emphasizing their shift between English (as a coding and instructional language) and Urdu (as a cognitive and expressive language).

3.2 Participants

A total of 60 bilingual computing students (30 male and 30 female) enrolled in the BS Computer Science program at Superior University participated. Participants were selected through purposive sampling, ensuring representation across academic years (Year 1 to Year 4). All participants had received instruction primarily in English but reported Urdu as their first language and dominant medium of thought.

Table 1: Participant Demographics

Variable	Category	Number of Participants (N=60)
Gender	Male	30
Gender	Female	30
Academic Year	Year 1	15
Academic Year	Year 2	15
Academic Year	Year 3	15
Academic Year	Year 4	15
Primary Home Language	Urdu	60
Instructional Language	English	60

3.3 Research Instruments

Two primary instruments were used:

1. **Questionnaire (Quantitative Phase):**
   A structured questionnaire was designed to measure students' frequency of translanguaging, perceived ease in switching languages, and attitudes toward using Urdu

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for cognitive processing during coding. The survey included Likert-scale items, open-ended prompts, and self-reported behavioral patterns.

2. Semi-Structured Interviews (Qualitative Phase):

Fifteen participants (selected through stratified sampling from the survey pool) participated in in-depth interviews exploring their language choices, self-perceptions, and emotional connections to their linguistic practices. Interviews were conducted in a hybrid of English and Urdu, allowing participants to express nuanced experiences.

3.4 Data Collection Procedures

Data collection occurred over six weeks. Week 1–2: Survey distribution and collection through Google Forms. Week 3–6: Interviews were conducted, transcribed, and anonymized. All participants gave informed consent, and ethical approval was obtained from the Department of English Studies, Superior University. Confidentiality and voluntary participation were maintained throughout.

3.5 Data Analysis

Quantitative Data Analysis:

Survey responses were analyzed using SPSS (Version 28). Descriptive statistics (mean, frequency, percentage) identified patterns in students' language use during coding, class participation, and group collaboration. Correlation tests explored relationships between language preference and academic year or gender.

Qualitative Data Analysis:

Interview data underwent thematic analysis following Braun and Clarke's six-step model. Emerging themes included language of thought, identity duality, and professional confidence. Transcripts were coded manually to capture recurring linguistic and identity markers.

3.6 Reliability and Validity

To ensure reliability, the questionnaire was pilot-tested with 10 students outside the main sample, yielding a Cronbach's alpha of 0.83, indicating strong internal consistency. Triangulation between survey and interview data strengthened validity. Researcher reflexivity was maintained through memos to minimize bias in interpretation.

4. Results

This section presents both quantitative and qualitative findings on how bilingual computing students at Superior University employ translanguaging to negotiate their academic and professional identities. Results are divided into two parts: (1) quantitative data from the student survey and (2) qualitative insights from semi-structured interviews.

4.1 Quantitative Results

4.1.1 Frequency and Functions of Translanguaging

The survey revealed that 92% of students reported using Urdu while thinking through coding problems, while 78% frequently translated coding concepts into Urdu to simplify understanding. Conversely, 100% used English for syntax and documentation purposes. These results confirm the prevalence of functional bilingualism, where Urdu serves as a cognitive language and English as a technical language.

Table 2: Language Use Patterns in Academic Settings

Activity	English (%)	Urdu (%)	Both (%)
Reading documentation	98	0	2
Writing code	100	0	0
Debugging errors	65	30	5

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Thinking through logic	8	82	10
Group discussion	45	25	30
Note-taking / planning	30	60	10

4.1.2 Relationship Between Translanguaging and Academic Confidence

A Pearson correlation test found a moderate positive relationship (r = 0.56) between translanguaging frequency and self-reported academic confidence. Students who reported higher comfort in using Urdu for cognitive processing also showed greater confidence in completing coding tasks and explaining concepts in English.

Table 3: Correlation between Translanguaging Frequency and Academic Confidence

Variable	r-value	p-value
Translanguaging frequency & Academic confidence	0.56	<0.01
Translanguaging frequency & Academic performance (GPA)	0.41	<0.05

4.1.3 Attitudes Toward Translanguaging in Professional Settings

When asked whether they consider translanguaging appropriate in professional or industry contexts, 63% of respondents expressed uncertainty. Many felt that while Urdu aids understanding, professional communication demands English proficiency. This highlights a perceived tension between linguistic authenticity and employability.

4.2 Qualitative Results

Fifteen semi-structured interviews provided deeper insights into how students construct academic and professional identities through translanguaging. Three central themes emerged from the data:

Theme 1: Urdu as the Language of Thought and Emotional Security

Students consistently described Urdu as their thinking language, particularly when facing complex coding challenges. One student stated: "When I'm solving a logic problem, I automatically switch to Urdu in my head — it makes the problem clearer. English is for writing, but Urdu is for understanding." This finding supports the idea that translanguaging is not merely linguistic switching but a cognitive tool that enhances problem-solving and emotional regulation. Students reported feeling "less pressure" and "more connected" when thinking in Urdu, especially during stressful tasks such as debugging or viva presentations.

Theme 2: Dual Identity — The 'Thinker in Urdu' and the 'Performer in English'

Students described living between two identities: the academic self, which communicates formally in English, and the authentic self, which processes ideas and emotions in Urdu. One participant commented: "In class, I present in English to sound professional, but when I'm brainstorming, it's Urdu that runs the show." This identity duality reflects the complex negotiation between linguistic competence and social expectations. Translanguaging allows students to maintain fluency across both worlds — academic (English) and personal (Urdu). The shift demonstrates the fluidity of linguistic borders, where language becomes a bridge rather than a barrier to identity formation.

Theme 3: Negotiating Professional Identity in Tech Spaces

While students valued Urdu for comprehension, many expressed concern about professional perception in the computing field. English was seen as a "badge of competence," essential for

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job interviews, documentation, and coding collaboration. Yet, most participants admitted using Urdu-based mental scripts even in professional tasks. "When I'm in a team meeting, I use English to explain, but in my mind, I rehearse in Urdu first," shared one final-year student preparing for an internship interview. This theme reveals the tension between authenticity and professionalism — students consciously adjust language use to align with workplace norms without abandoning their linguistic roots.

4.3 Integration of Quantitative and Qualitative Findings

The combination of numerical and narrative data highlights how translanguaging functions as both a learning strategy and an identity resource. While quantitative results demonstrated its prevalence and positive correlation with academic confidence, qualitative insights revealed its deeper role in shaping how bilingual computing students view themselves as learners and professionals.

Table 4: Integrated Summary of Quantitative and Qualitative Findings

Aspect	Quantitative Finding	Qualitative Insight
Language use	82% think in Urdu while coding	Urdu provides clarity and emotional comfort
Academic confidence	Correlates positively (r = 0.56)	Urdu thinking enhances self-assurance
Professional identity	63% unsure about translanguaging at work	Students negotiate between 'academic English' and 'authentic Urdu' selves
Cognitive impact	Translanguaging aids comprehension	Students mentally translate technical English to Urdu concepts

4.4 Discussion of Key Patterns

The findings suggest that translanguaging among bilingual computing students is not a sign of deficiency but an adaptive academic practice. By thinking in Urdu and performing in English, students bridge linguistic gaps and internalize complex computing concepts effectively. However, a subtle linguistic hierarchy persists: English remains associated with power, prestige, and professionalism, while Urdu is tied to emotion, identity, and comfort. This dynamic mirrors broader sociolinguistic hierarchies in Pakistan's education system, where English functions as the 'language of success.' Overall, translanguaging empowers students to mediate between cultural belonging and academic legitimacy, supporting both cognitive depth and professional aspiration.

5. Conclusion

This study explored how bilingual computing students at Superior University negotiate their academic and professional identities through translanguaging—specifically, through the cognitive practice of thinking in Urdu while coding in English. The mixed-methods findings revealed that translanguaging is a strategic and empowering linguistic behavior, rather than a deficiency. It enables students to internalize complex technical concepts, sustain cognitive clarity, and build confidence in expressing ideas within English-dominant academic spaces.

Quantitative results demonstrated a positive correlation between translanguaging frequency and academic confidence, while qualitative data illuminated how Urdu functions as an intellectual home language—a medium for emotional grounding, reflective thought, and creativity. Yet, students also experienced tension between authenticity and professionalism, often perceiving English as essential for employability in global tech contexts. The study concludes that translanguaging serves as a bridge between cognition and

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communication, fostering identity balance among bilingual learners. Recognizing and validating this linguistic flexibility within computing education can promote more inclusive and effective pedagogical practices, allowing students to thrive both as culturally rooted individuals and globally competent professionals.

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