

Digital Transformation and Multilingual Language Education in Makassar's Higher Education: A Mixed-Methods Study of Students and Faculty

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ABSTRACT

In Indonesia's multilingual higher education landscape, especially in Eastern regions like Makassar, institutions face growing challenges in developing students' academic literacy in both Indonesian and English amid rapid digital transformation. This study investigates how digital tools, pedagogical practices, and cultural factors intersect in shaping language learning outcomes. Using a sequential explanatory mixed-methods design, the study surveyed 200 students and 50 faculty members across five universities in Makassar, followed by interviews, focus groups, and classroom observations conducted between August 2023 and March 2024. Quantitative data included self-assessed language proficiency, digital literacy, and learning motivation. Qualitative data provided contextual insights into classroom practices and institutional dynamics. Quantitative analysis revealed major gaps in productive English skills—73% of students reported difficulties in speaking—and substantial challenges in Indonesian academic writing. Faculty quality ($\beta = 0.79, p < .001$) and student motivation ($\beta = 0.72, p < .01$) were the strongest predictors of success. Qualitative findings emphasized the role of translanguaging, culturally responsive teaching, and the digital divide in shaping learning experiences. A hybrid learning model (40% online, 60% face-to-face) integrating translanguaging strategies and local cultural practices emerged as a promising approach. The study recommends faculty development in digital pedagogy and inclusive curriculum design. Strengthening multilingual education in resource-constrained contexts requires context-specific innovations that bridge global competencies with local identities through culturally grounded digital transformation.

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1. INTRODUCTION

The accelerating forces of globalization and digital transformation have intensified the demand for multilingual competence in higher education, positioning language proficiency as a critical determinant of academic success and global competitiveness. Universities are increasingly required to prepare graduates who can navigate international knowledge networks while remaining rooted in their local cultural and linguistic identities. This tension between global engagement and cultural preservation is particularly evident in multilingual societies, where digital innovation must be carefully integrated without marginalizing indigenous languages and local epistemologies. Within this broader context, this study addresses critical gaps in multilingual education research by examining how higher education institutions in Eastern Indonesia can leverage digital transformation while safeguarding linguistic diversity and cultural identity. Specifically, it investigates: (1) the patterns of English and Indonesian academic proficiency among multilingual students in Makassar's universities; (2) the institutional and individual factors that predict language learning outcomes; and (3) the design of a contextually appropriate hybrid learning model that integrates digital technologies with local cultural practices.

Higher education systems worldwide are undergoing profound restructuring as a result of technological advancement, cross-border mobility, and the growing expectation for multilingual graduates (Alenezi et al., 2023). Language education has consequently become a strategic arena situated at the intersection of linguistic diversity, cultural identity, and digital innovation. Multilingualism is widely recognized as both a cognitive asset and a socio-economic necessity (Hidayat et al., 2022), while digital transformation simultaneously offers new pedagogical opportunities and structural challenges (Esteve-Mon et al., 2023). In Indonesia—home to more than 700 living languages—these dynamics acquire additional complexity, particularly in universities tasked with equipping students to compete locally and globally. Makassar, as the educational hub of Eastern Indonesia, hosts five major universities serving over 150,000 students from diverse linguistic backgrounds, including Buginese, Makassarese, Torajan, and other indigenous languages. This cosmopolitan academic landscape represents a rich multilingual ecology in which students negotiate local languages, Indonesian as the national language, and varying levels of English proficiency within increasingly digitalized learning environments.

The COVID-19 pandemic accelerated digital transformation at an unprecedented pace (Dąbrowska et al., 2022), exposing both the potential and limitations of technology-mediated language learning in multilingual contexts. Despite significant pressure for transformation, language education in Indonesian higher education faces effectiveness challenges. National data indicates that only 34% of Indonesian higher education graduates achieve functional English proficiency (Mohamed Hashim et al., 2022), while Indonesian academic literacy remains uneven, particularly in Eastern Indonesia where resource constraints and infrastructure disparities exacerbate existing inequalities (Steigerwald et al., 2022).

Previous studies have examined multilingualism as a cognitive advantage (Deroncele-Acosta et al., 2023; Shenkoya & Kim, 2023) and technology-enhanced language learning effectiveness (Khoza & Mpungose, 2022), but few have systematically examined the intersection of multilingualism, digital transformation, and cultural integration in Indonesian higher education contexts. Research on Eastern Indonesia, particularly Makassar as a multilingual hub, remains limited compared to Java-based studies, and existing hybrid learning models often overlook students' cultural and linguistic specificity.

This study contributes to multilingual education literature by: (1) providing empirical evidence from a large, rarely studied multilingual population in Eastern Indonesia; (2) integrating multiple stakeholder perspectives through robust mixed-methods design; (3) proposing a culturally responsive hybrid learning model that synthesizes global pedagogical innovations with local wisdom; and (4) offering practical frameworks for institutions in similar developing country contexts. The convergence of these linguistic traditions within the academic sphere creates an unprecedented opportunity to

examine how multilingual competencies can be leveraged to enhance both Indonesian and English language acquisition (Martín Ruano, 2020).

The five major universities under investigation represent the educational backbone of the region. Hasanuddin University, as the flagship state institution, commands respect for its research excellence and international collaborations. State University of Makassar brings pedagogical expertise through its strong teacher education programs. Muslim University of Indonesia offers a unique perspective with its integration of Islamic values and multilingual approaches. Bosowa University contributes industry-oriented perspectives, while Fajar University provides innovative teaching methodologies. Together, these institutions serve over 150,000 students, making Makassar the largest concentration of higher education in Eastern Indonesia.

The complexity of language education in Makassar's higher education sector emerges from the intersection of multiple challenging factors. The digital competency gap represents more than a simple technological divide; it reflects deeper issues of educational equity, resource allocation, and pedagogical preparedness. Many faculty members, despite their linguistic expertise, find themselves navigating unfamiliar digital terrain without adequate support systems or training programs. Students, while often digitally native in social media usage, lack the sophisticated digital literacy required for effective online language learning.

The variation in student language proficiency levels creates classroom dynamics that challenge traditional pedagogical approaches (Wu, 2020). Students arriving from remote areas of Papua or Maluku may possess limited exposure to formal Indonesian academic register, while their English proficiency varies dramatically based on their secondary school experiences. This heterogeneity demands innovative pedagogical responses that can accommodate diverse learning needs while maintaining academic rigor and standards (Zacharis & Nikolopoulou, 2022).

The integration of local cultural elements into language curricula presents both philosophical and practical challenges (Lagstedt et al., 2020). While educators recognize the value of cultural responsiveness, they struggle to develop materials and methodologies that authentically incorporate local wisdom without compromising international standards. This challenge is particularly acute in English language teaching, where global communicative competence must be balanced with cultural identity preservation (Ismailov, 2021). Curriculum relevance concerns extend beyond simple content updates to encompass fundamental questions about the purposes and outcomes of language education. As the job market increasingly demands sophisticated multilingual competencies, graduates must develop not only linguistic fluency but also intercultural communication skills, digital literacy, and critical thinking abilities that enable them to navigate complex global-local interfaces (Fúzi et al., 2022).

This study addresses a series of interrelated issues in the context of multilingual higher education in Makassar. First, there is a persistent gap between receptive and productive skills in English: while many students can read and listen at an intermediate level, their speaking and writing skills lag far behind (Brink et al., 2020). Second, academic literacy in Indonesian, particularly in formal writing and scientific communication, remains underdeveloped due to limited guidance on academic language varieties. Third, the shift to online and hybrid learning has revealed digital literacy disparities among students and lecturers, limiting the pedagogical potential of technology (Tondeur et al., 2023). Fourth, educators often find it challenging to integrate local cultural values and students' multilingual identities meaningfully into language teaching, which leads to a decline in learning motivation (Salama & Hinton, 2023). The absence of coherent institutional strategies for faculty capacity development, curriculum relevance, and digital infrastructure in multilingual educational settings exacerbates these challenges.

This investigation pursues four interconnected objectives that collectively contribute to understanding and improving language education in multilingual higher education contexts. The analysis of current conditions encompasses not only proficiency levels and learning outcomes but also the social, cultural, and technological factors that influence language acquisition. The identification of challenges and opportunities requires examining both structural constraints and innovative possibilities within the existing educational ecosystem.

The formulation of improvement recommendations demands evidence-based approaches that consider local contexts, resource constraints, and stakeholder needs. These recommendations must be practical enough for immediate implementation while visionary enough to guide long-term strategic planning. The exploration of contextually appropriate learning models represents perhaps the most significant contribution, as it addresses the gap between globally recognized best practices and locally relevant pedagogical approaches. The significance of this research extends beyond the immediate Makassar context to contribute to broader discussions about multilingual education in developing countries, technology integration in language learning, and the role of higher education in preserving cultural identity while promoting global competitiveness.

Previous studies have examined multilingualism as a cognitive and educational advantage (Deroncele-Acosta et al., 2023; Shenkoya & Kim, 2023), emphasizing the metalinguistic awareness and cognitive flexibility it produces. Communicative Language Teaching (CLT) and Technology-Enhanced Language Learning (TELL) are widely recommended as effective language learning strategies in various contexts (Khoza & Mpungose, 2022). The digital transformation's significant but uneven impact on language teaching and learning in higher education in Indonesia (Rof et al., 2020). Integrating local cultural elements into multilingual education to preserve cultural identity and student engagement (Trevisan et al., 2024).

However, most studies still focus on the challenges of English language education separately or the potential of digital technology without fully addressing the interaction between multilingual realities, cultural responsiveness, and pedagogical innovation in the diverse Indonesian context. Although these studies are valuable contributions, there are still important gaps in the literature. Only a few studies have systematically examined the intersection of multilingualism, digital transformation, and cultural integration in Indonesian higher education. Research on Eastern Indonesia, particularly Makassar as a multilingual hub, rarely compares to studies conducted in Java or more developed regions. Additionally, existing hybrid learning models often overlook students' cultural and linguistic specificity, thereby failing to account for local contexts and student heterogeneity.

Therefore, context-based empirical research is needed to explore meaningful ways to utilize multilingual resources and digital technologies. This study offers several new contributions to the field of multilingual education. First, it presents empirical evidence from a large and rarely studied multilingual population in Makassar, filling a geographical and thematic gap in the literature. Second, it integrates perspectives from various stakeholders—students, lecturers, and institutions—through a robust mixed-methods design, enabling a comprehensive understanding of the issues. Third, it proposes a culturally responsive hybrid learning model by synthesizing global pedagogical innovations and local wisdom, offering a practical framework for institutions in similar contexts. Finally, the findings of this study have broad implications for multilingual education policy and practice in developing countries, demonstrating how digital transformation can be leveraged to support, rather than erode, linguistic diversity and cultural identity.

In addition to contributing conceptually to the academic literature and national education policy, this study has tangible contributions to higher education institutional development, particularly in Eastern Indonesia. The findings of this study provide an empirical basis for higher education institutions to formulate strategies for strengthening internal capacity in language education that are more adaptive to global and local demands simultaneously. The locally-based hybrid learning model developed in this study can be implemented as a curriculum innovation that supports internationalization programs without neglecting students' cultural roots.

Furthermore, this research highlights the importance of improving lecturers' pedagogical competence and digital literacy as key predictors of language learning success. Therefore, the recommendations generated can serve as a reference for universities to design integrated professional development programs for lecturers, including training in learning technology, culturally responsive strategies, and multilingual approaches. This study also encourages universities to strengthen their

digital infrastructure and build a campus environment that supports collaborative and communicative learning practices, in line with the vision of 21st-century higher education.

In addition, this study provides insights for university administrators on the importance of designing more inclusive language policies, recognizing and utilizing students' initial linguistic competencies as learning assets rather than obstacles. Thus, the findings of this research are relevant for improving classroom learning quality and have implications for formulating strategic policies at the institutional level to build competitive advantage based on each higher education institution's unique local context.

2. METHODS

This investigation employed a sequential explanatory mixed-methods design integrating quantitative survey data with qualitative insights from interviews, focus groups, and classroom observations. The pragmatic paradigm was selected for its emphasis on practical problem-solving and recognition that complex educational phenomena require multiple analytical perspectives. The study was not preregistered.

2.1 Study Design and Timeline

The study was conducted in two sequential phases. Phase 1 (August–October 2023) involved the collection of quantitative data through structured surveys administered to participants. Phase 2 (November 2023–March 2024) focused on qualitative data collection, utilizing in-depth interviews, focus group discussions, and classroom observations to gain contextual insights. Integration of the two datasets occurred during the analysis and interpretation stages, whereby qualitative findings were used to explain, elaborate, and contextualize the patterns identified in the quantitative results.

2.2 Setting and Participants

Participants were recruited through stratified sampling across five universities in Makassar. Inclusion criteria for students: enrolled in language courses, semester 2 or above, and consent to participate. Exclusion criteria: exchange students, part-time enrollment. Faculty inclusion criteria: teaching Indonesian or English, minimum 1 year of experience. Response rates: students 83% (200/241 invited), faculty 78% (50/64 invited). Non-response analysis showed no significant differences in demographics between responders and non-responders.

The student sample (N=200) was proportionally distributed across institutions and disciplines: 45% early undergraduate (semesters 2-4), 35% advanced undergraduate (semesters 5-7), 20% final year/graduate. Gender distribution: 58% female, 42% male. Regional origins: 52% South Sulawesi, 18% Southeast Sulawesi, 12% Central Sulawesi, 8% North Sulawesi, 10% Maluku & Papua. Faculty sample (N=50) included 60% Indonesian language instructors, 40% English language instructors, with experience ranging from 1 to 25 years.

2.3 Instruments

Quantitative measures included: Self-assessed language proficiency scales (1-5 Likert): Speaking, reading, writing, listening competencies with anchors (1=Very Poor, 5=Excellent). Indonesian version developed through translation and back-translation procedures. Technology Acceptance Model adapted for language learning contexts (Cronbach's $\alpha = .89$). Cultural attitudes scale developed locally ($\alpha = .84$). Learning motivation inventory validated in Indonesian contexts ($\alpha = .91$)

Qualitative protocols included semi-structured interview guides (45-60 minutes), focus group discussion themes (90 minutes), and classroom observation protocols (3 sessions per course type, 50 minutes each). All qualitative data collected in participants' preferred language (Indonesian/English), with professional translation for analysis.

Procedures

Data collection was conducted entirely in person across all five participating universities. Classroom observations systematically sampled different course types (grammar, conversation, academic writing) with three sessions observed per course type at each institution, totalling 45 observation sessions of 50 minutes each. Interview and focus group sampling employed purposive selection to ensure representation across proficiency levels, academic disciplines, and institutional contexts. Semi-structured interviews were conducted in private campus offices, while focus group discussions took place in university meeting rooms with 6-8 participants per group. All sessions were audio-recorded with explicit written consent, transcribed verbatim by trained research assistants, and professionally translated from Indonesian to English when necessary for analysis.

Analysis

Quantitative analysis used SPSS 28.0. Missing data (<5%) handled through listwise deletion. Multiple linear regression examined predictors of language proficiency with assumptions checked: linearity (scatterplots), normality (Shapiro-Wilk tests), homoscedasticity (residual plots), multicollinearity (VIF values <3.0). Bootstrap confidence intervals calculated for regression coefficients.

Qualitative analysis employed reflexive thematic analysis following Braun & Clarke's six-phase approach. Two researchers independently coded 20% of data, achieving Cohen's $\kappa = .87$ for intercoder agreement. NVivo 12 facilitated analysis with an audit trail maintained throughout.

Mixed-methods integration used joint displays comparing quantitative patterns with qualitative themes, generating meta-inferences about multilingual education challenges and opportunities.

3. FINDINGS AND DISCUSSION

3.1 Findings

This study presents a comprehensive overview of the current state of multilingual education and digital transformation in higher education institutions in Makassar. Using a mixed-method approach that integrates quantitative surveys of 200 students and 50 faculty members with in-depth interviews, focused group discussions, and classroom observations, the findings reveal systemic challenges and emerging opportunities in efforts to develop multilingual competencies within a digital learning environment. Quantitative analysis shows significant disparities in English proficiency—particularly in productive skills—and striking gaps in Indonesian academic literacy, underscoring the need for more responsive pedagogical innovations. Qualitative data enriches these findings by revealing the real-life experiences of students and lecturers in dealing with linguistic diversity, maintaining cultural identity, and managing technological limitations in daily academic practices.

This mixed-methods investigation reveals complex patterns in multilingual education and digital transformation across Makassar's higher education institutions. Quantitative analysis demonstrates significant disparities in productive language skills, while qualitative data contextualizes these findings within lived experiences of linguistic diversity and technological adaptation.

Demographic Profile and Linguistic Landscape

Table 1. Student Demographics and Linguistic Background (N=200)

Characteristic	Distribution	Count	Percentage
Academic Level			
Semesters 2-4	Early Undergraduate	90	45%
Semesters 5-7	Advanced Undergraduate	70	35%
Semester 8+	Final Year/Graduate	40	20%
Regional Origin			
South Sulawesi	Local	104	52%
Southeast Sulawesi	Regional	36	18%
Central Sulawesi	Regional	24	12%

Characteristic	Distribution	Count	Percentage
North Sulawesi	Regional	16	8%
Maluku & Papua	Distant Regions	20	10%
First Language (L1)			
Indonesian	National Language	56	28%
Buginese	Largest Regional	62	31%
Makassarese	Local Dominant	46	23%
Torajan	Highland Language	24	12%
Other Regional	Various	12	6%

Note: Percentages may not total 100% due to rounding.

The demographic analysis reveals remarkable linguistic diversity characteristic of Eastern Indonesia's educational landscape. Only 28% of students claim Indonesian as their first language, underscoring the multilingual complexity of the educational environment. This linguistic diversity creates both opportunities and challenges for language education, as students with strong regional language competencies possess sophisticated metalinguistic awareness that can facilitate additional language learning.

The demographic analysis reveals the remarkable linguistic diversity characteristic of Eastern Indonesia's educational landscape. The fact that only 28% of students claim Indonesian as their first language underscores the multilingual complexity of the educational environment. The dominance of Buginese speakers (31%) reflects the historical and cultural influence of the Bugis people throughout the region, while the significant presence of Makassarese speakers (23%) demonstrates the local cultural foundation of the student body. This linguistic diversity creates both opportunities and challenges for language education. Students with strong regional language competencies possess sophisticated metalinguistic awareness that can facilitate additional language learning. However, the structural and phonological differences between regional languages and both Indonesian and English can create specific interference patterns that require targeted pedagogical interventions. The geographical distribution of students illuminates the regional influence of Makassar's universities, with students from distant regions like Maluku and Papua representing 10% of the sample. These students often face additional challenges related to cultural adaptation, linguistic distance, and limited family support systems, factors that significantly influence their language learning experiences and outcomes.

English Language Proficiency and Learning Challenges

Table 2. English Language Proficiency Self-Assessment (N=200)

English Proficiency Self-Assessment	Speaking	Reading	Writing	Listening
Excellent	8% (16)	15% (30)	6% (12)	12% (24)
Good	19% (38)	32% (64)	22% (44)	28% (56)
Fair	36% (72)	38% (76)	41% (82)	39% (78)
Poor	27% (54)	12% (24)	24% (48)	18% (36)
Very Poor	10% (20)	3% (6)	7% (14)	3% (6)

Note: Based on self-assessment using a 5-point Likert scale. Limitations include potential response bias in self-reporting.

The English proficiency assessment reveals significant challenges in productive skills, with speaking and writing showing the lowest levels of competency. Only 27% of students rate their speaking abilities as good or excellent, while 37% acknowledge poor or very poor speaking proficiency. This pattern reflects common challenges in English as a Foreign Language (EFL) context where students have limited opportunities for authentic oral communication practice. The relatively stronger performance in receptive skills (reading and listening) suggests that students are developing passive competencies through exposure to English media, academic texts, and online content. However, the

gap between receptive and productive skills indicates that current pedagogical approaches may not be providing sufficient opportunities for active language use and meaningful communication practice.

Table 3. Primary Learning Challenges by Frequency and Severity (N=200)

Primary Learning Challenges	Frequency	Percentage	Severity Rating
Linguistic Factors			
Pronunciation interference	146	73%	High
Limited academic vocabulary	132	66%	High
Syntactic structure differences	124	62%	Medium
Methodological Factors			
Teacher-centered approaches	130	65%	High
Limited communication practice	118	59%	Medium
Minimal interactive technology	102	51%	Medium
Motivational Factors			
Low intrinsic motivation	116	58%	Medium
Perceived irrelevance	98	49%	Medium
Limited exposure	88	44%	Low
Infrastructure Factors			
Internet connectivity issues	104	52%	High
Inadequate lab facilities	92	46%	Medium
Limited digital resources	76	38%	Low

Severity: 1=Low to 3=High, self-rated on 3-point scale

Pronunciation interference emerges as the most dominant challenge, reported by 73% of students with high severity ratings, indicating that phonological differences between students' native languages and English create significant barriers to oral communication. Qualitative data reinforces these findings. As one student noted: "When I speak English, my Buginese accent is very strong. Sometimes people cannot understand me, so I become shy to speak" (S14, Interview, translated from Indonesian). Faculty observations confirm this pattern: "Students often transfer intonation patterns from their regional languages, which affects English intelligibility" (F07, Focus Group).

This indicates that phonological differences between students' native and target languages (English) are a significant barrier to oral communication. In addition, limited academic vocabulary (66%, high severity) also significantly affects students' ability to understand and produce academic texts in English, while syntactic structure differences (62%) are rated as moderate severity, indicating a need for more targeted contrastive grammar learning. In the methodological dimension, 65% of students identified teacher-centred approaches as the main obstacle with a high severity level. Limited opportunities for communication practice (59%, moderate severity) and low utilization of interactive technology (51%, moderate severity) reinforce the finding that current pedagogical strategies are not yet optimal in promoting students' communicative skills and the use of technology for more collaborative learning. Motivational factors are also significant, with 58% of students reporting low intrinsic motivation as a major challenge (moderate severity). Perceptions that language learning is irrelevant to their needs (49%) and limited exposure to the target language environment (44%) highlight the importance of a more contextual and student-needs-based curriculum design. Finally, infrastructure factors remain a major structural constraint. Internet connectivity issues (52%, high severity) and inadequate laboratory facilities (46%, moderate severity) highlight limitations in the infrastructure supporting technology-based language learning. Meanwhile, limited digital resources (38%, low severity) remain a challenge that requires attention.

The challenge analysis reveals that linguistic factors represent the most significant obstacles to English language acquisition, with pronunciation interference affecting nearly three-quarters of

students. This finding reflects the phonological differences between regional languages and English, particularly in vowel systems, consonant clusters, and stress patterns that do not exist in Indonesian or regional languages. Limited academic vocabulary emerges as another critical challenge, affecting two-thirds of students. This deficiency significantly impacts students' ability to engage with academic texts, participate in scholarly discussions, and produce written work that meets university standards. The vocabulary gap is particularly pronounced in specialized disciplinary areas where English technical terminology is increasingly prevalent. Methodological factors, while somewhat less prevalent than linguistic challenges, still affect the majority of students. The persistence of teacher-centered approaches limits opportunities for active language use and communicative practice. This pedagogical orientation, while perhaps culturally familiar, fails to provide the interactive engagement necessary for developing communicative competence in English.

Indonesian Academic Language Development

Table 4. Indonesian Academic Language Proficiency (N=200)

Indonesian Academic Proficiency	Academic Writing	Presentation Skills	Text Comprehension
Excellent	11% (22)	16% (32)	19% (38)
Good	25% (50)	31% (62)	36% (72)
Fair	42% (84)	38% (76)	33% (66)
Poor	18% (36)	13% (26)	10% (20)
Very Poor	4% (8)	2% (4)	2% (4)

The Indonesian academic language assessment reveals a more positive overall picture compared to English proficiency, with the majority of students demonstrating fair to excellent competencies across all measured domains. However, the concentration of students in the "fair" category suggests significant room for improvement in academic language development. Text comprehension shows the strongest performance, with 55% of students rating their abilities as good or excellent. This finding suggests that students are developing effective strategies for understanding academic Indonesian texts, possibly through extensive exposure to university-level reading materials and coursework demands. Academic writing presents the greatest challenge within Indonesian language competencies, with only 36% of students rating their abilities as good or excellent. This finding is particularly concerning given the central role of academic writing in university success and professional development. The challenges in academic writing likely reflect limited exposure to sophisticated rhetorical structures, unfamiliarity with disciplinary discourse conventions, and insufficient feedback on writing development.

Table 5. Indonesian Academic Language Challenges (N=200)

Indonesian Language Challenges	Academic Register	Regional Interference	Practice Opportunities
Frequency	136 (68%)	108 (54%)	122 (61%)
Severity	High	Medium	High
Impact on Learning	Significant	Moderate	Significant

The challenge analysis for Indonesian academic language reveals that academic register difficulties affect the majority of students, with 68% reporting challenges in using appropriate formal language structures, specialized vocabulary, and scholarly discourse patterns. This challenge reflects the significant differences between conversational Indonesian and the sophisticated academic register required for university-level work. Regional language interference, while affecting somewhat fewer students (54%), represents a persistent challenge that requires targeted pedagogical attention. Students may unconsciously transfer syntactic patterns, discourse markers, or pragmatic conventions from their first languages into formal Indonesian contexts, potentially affecting the clarity and appropriateness of their academic communication. The lack of sufficient practice opportunities emerges as a critical systemic challenge affecting 61% of students. This finding suggests that current curricular structures may not provide adequate scaffolding for academic language development, with students receiving

limited feedback on their Indonesian language use and minimal opportunities to engage in extended academic discourse.

3.1.1 Technology Integration and Digital Learning Effectiveness

Table 6. Digital Platform Usage and Effectiveness (N=200)

Digital Platform	Usage Frequency	Effectiveness Rating	User Satisfaction
Google Classroom	78% (156)	3.2/5.0	Moderate
WhatsApp Groups	65% (130)	3.8/5.0	High
Zoom/Google Meet	61% (122)	2.9/5.0	Low
YouTube	54% (108)	4.1/5.0	High
Mobile Learning Apps	23% (46)	3.5/5.0	Moderate

Note: Effectiveness and Satisfaction were rated on 5-point scales. Sample sizes vary as some students use multiple platforms.

The technology usage patterns reveal interesting disparities between adoption rates and effectiveness perceptions. While Google Classroom shows the highest adoption rate at 78%, its effectiveness rating of 3.2/5.0 suggests that students find the platform useful but not particularly engaging or pedagogically effective for language learning. WhatsApp Groups demonstrate high user satisfaction (3.8/5.0) despite their informal nature, suggesting that students value the immediate communication, peer support, and accessible interface that WhatsApp provides. This finding indicates potential opportunities for leveraging familiar social media platforms for more structured language learning activities. YouTube's combination of moderate usage (54%) with high effectiveness rating (4.1/5.0) highlights the platform's potential for language learning through authentic content, multimedia engagement, and self-directed learning opportunities. The high satisfaction with YouTube suggests that students respond positively to visual and audio learning materials that provide cultural context and authentic language use examples. The low adoption rate of specialized mobile learning applications (23%) may reflect limited awareness, technological barriers, or preferences for more familiar platforms. However, the moderate effectiveness rating (3.5/5.0) among users suggests potential for expanded implementation with appropriate support and training.

The comparative analysis across the five participating universities reveals distinct institutional strengths, challenges, and approaches to language education, providing insights into how different institutional contexts shape language learning outcomes and experiences. Hasanuddin University demonstrates clear advantages in infrastructure and international connectivity, with state-of-the-art language laboratories, extensive digital resources, and established partnerships with universities in Australia, Japan, and Europe. These resources enable sophisticated English for Specific Purposes programs that prepare students for international academic and professional contexts. However, the university's high academic standards and diverse student population create challenges in accommodating varying proficiency levels, with some students struggling to meet rigorous language requirements while others find the pace too slow for their abilities.

State University of Makassar leverages its pedagogical expertise through innovative teaching methodologies and strong faculty development programs. The university's teacher education focus creates a culture of pedagogical reflection and experimentation that benefits language instruction across all disciplines. Faculty members regularly engage in action research projects that inform classroom practice and contribute to broader understanding of effective language pedagogy in multilingual contexts. However, limited technology budgets constrain the university's ability to implement cutting-edge digital learning solutions, requiring creative approaches to technology integration using available resources.

Muslim University of Indonesia offers a unique trilingual educational environment that integrates Arabic, Indonesian, and English instruction within an Islamic educational framework. This approach provides valuable insights into multilingual education while connecting language learning to religious

and cultural identity. The university's international Islamic networks provide authentic contexts for multilingual communication and cultural exchange. Students develop sophisticated code-switching abilities and metalinguistic awareness through exposure to three distinct linguistic systems. However, coordinating trilingual curricula across different faculties presents ongoing challenges in ensuring balanced language development and avoiding curriculum overload.

Bosowa University demonstrates entrepreneurial approaches to language education through strong industry partnerships and flexible curricular structures. The university's connections with multinational corporations provide authentic contexts for English language use and professional development opportunities. Students engage in internships, industry projects, and guest lectures that bridge academic language learning with professional communication requirements. This practical orientation enhances student motivation and provides clear pathways from language learning to career advancement. However, maintaining consistent quality standards across diverse programs requires ongoing attention to faculty development and curriculum coordination.

Fajar University showcases innovation in teaching methodologies through experimental approaches to blended learning, gamification, and culturally responsive pedagogy. The university encourages faculty creativity and student-centered learning approaches that often serve as models for other institutions. Student exchange programs and international partnerships provide opportunities for immersive language experiences and cultural exchange. However, limited resources sometimes constrain the sustainability and scalability of innovative programs, requiring ongoing fundraising and partnership development to maintain program quality.

Statistical Analysis of Success Factors

Table 7. Statistical Analysis of Success Factors

Success Predictors	Beta Coefficient	Significance	Effect Size	Practical Impact
<i>Internal Factors</i>				
	β	95% CI	p-value	Effect Size
Learning Motivation	$\beta = 0.72$	$p < 0.01$	Large	High
Linguistic Background	$\beta = 0.58$	$p < 0.05$	Medium	Moderate
Learning Autonomy	$\beta = 0.64$	$p < 0.01$	Medium	High
<i>External Factors</i>				
	β	95% CI	p-value	Effect Size
Faculty Quality	$\beta = 0.79$	$p < 0.001$	Large	Very High
Infrastructure	$\beta = 0.61$	$p < 0.01$	Medium	High
Campus Environment	$\beta = 0.55$	$p < 0.05$	Medium	Moderate

Note: Model $R^2 = .68$, Adjusted $R^2 = .65$, $F(6,193) = 67.4$, $p < .001$. All predictors standardized. VIF values < 2.8 , indicating no multicollinearity concerns.

Faculty quality emerges as the strongest predictor of language learning success ($\beta = 0.79$, $p < 0.001$), underscoring the critical importance of investing in comprehensive faculty development programs. Learning motivation shows the second strongest association ($\beta = 0.72$, $p < 0.01$), confirming theoretical expectations about student engagement's central role in language acquisition.

The regression analysis identifies faculty quality as the strongest predictor of language learning success, with a beta coefficient of 0.79 and very high statistical significance ($p < 0.001$). This finding underscores the critical importance of investing in faculty development, pedagogical training, and ongoing professional support. Effective language instruction requires not only linguistic competence but also sophisticated understanding of multilingual learners, culturally responsive pedagogy, and technology integration strategies. Learning motivation emerges as the second strongest predictor ($\beta = 0.72$, $p < 0.01$), confirming theoretical expectations about the central role of student engagement and goal orientation in language acquisition. This finding suggests that pedagogical approaches that enhance intrinsic motivation, connect language learning to student interests and career goals, and provide meaningful communication opportunities will yield significant improvements in learning outcomes.

Learning autonomy shows substantial predictive power ($\beta = 0.64$, $p < 0.01$), indicating that students who develop self-directed learning strategies and take responsibility for their own language development achieve better outcomes than those who rely primarily on teacher-directed instruction. This finding supports pedagogical approaches that gradually transfer responsibility from teachers to learners and provide scaffolding for independent language use and practice. The infrastructure factor ($\beta = 0.61$, $p < 0.01$) confirms the importance of technological resources, internet connectivity, and modern learning facilities in supporting effective language instruction. However, the moderate effect size suggests that infrastructure improvements alone are insufficient without corresponding investments in faculty development and pedagogical innovation.

The analysis of cultural integration strategies reveals significant potential for enhancing language learning effectiveness through connections to local cultural practices, traditional knowledge systems, and community-based learning opportunities. Students demonstrate higher engagement and retention when language learning activities incorporate familiar cultural contexts while simultaneously expanding their global perspectives. Traditional storytelling practices from Bugis and Makassar cultures provide rich resources for developing narrative competencies in both Indonesian and English. Students who participate in storytelling projects that involve translating, adapting, and presenting traditional tales show improvements in vocabulary development, discourse organization, and cultural confidence. These projects simultaneously preserve cultural heritage while developing sophisticated language competencies that transfer to academic and professional contexts.

The integration of local environmental knowledge, traditional ecological practices, and community development projects creates authentic contexts for academic language use in both Indonesian and English. Students conducting research on traditional fishing practices, sustainable agriculture, or cultural preservation develop specialized vocabulary, research skills, and presentation competencies while contributing to community knowledge preservation and development. Music and artistic traditions offer particularly powerful resources for language learning, with students responding enthusiastically to projects involving translation of traditional songs, creation of multilingual performances, and documentation of artistic practices. These activities develop phonological awareness, rhythmic understanding of language, and cultural pride while providing enjoyable and memorable learning experiences.

3.1.2 Cultural Integration and Pedagogical Innovation

Qualitative analysis reveals significant potential for enhancing language learning through connections to local cultural practices. Students demonstrate higher engagement when language learning activities incorporate familiar cultural contexts while expanding global perspectives. Traditional storytelling practices from Bugis and Makassar cultures provide rich resources for developing narrative competencies in both Indonesian and English.

"When we translate our traditional stories into English, I understand better how language works. It's not just grammar—it's about sharing our culture with the world" (S23, Focus Group, translated from Indonesian).

Music and artistic traditions offer particularly powerful resources for language learning, with students responding enthusiastically to projects involving translation of traditional songs and creation of multilingual performances.

3.1.3 Institutional Comparative Analysis

The five participating universities demonstrate distinct approaches to multilingual education:

1. Hasanuddin University leverages state-of-the-art infrastructure and international partnerships to offer sophisticated English for Specific Purposes programs. However, diverse student proficiency levels create accommodation challenges.

2. State University of Makassar utilizes pedagogical expertise through innovative methodologies and strong faculty development programs, though limited technology budgets constrain digital integration.
3. Muslim University of Indonesia provides unique trilingual education (Arabic, Indonesian, English) within Islamic frameworks, developing sophisticated code-switching abilities among students.
4. Bosowa University demonstrates entrepreneurial approaches through industry partnerships, providing authentic professional communication contexts.
5. Fajar University showcases innovation through experimental blended learning and culturally responsive pedagogy approaches

3.2 Discussion

3.2.1 Multilingual Advantage and Pedagogical Innovation

The research findings strongly support theoretical predictions about the cognitive advantages of multilingualism while revealing the complex pedagogical challenges involved in leveraging these advantages within formal educational settings. Students with strong regional language competencies demonstrate superior metalinguistic awareness, enabling them to analyze grammatical structures, identify linguistic patterns, and transfer learning strategies across languages more effectively than their monolingual peers.

However, realizing these potential advantages requires pedagogical approaches that explicitly recognize and build upon students' existing linguistic resources rather than treating multilingualism as a deficit to be overcome. Traditional language teaching methods that enforce strict monolingual classroom policies fail to capitalize on students' sophisticated linguistic knowledge and may actually inhibit language development by forcing students to suppress their most developed linguistic competencies. The concept of translanguaging offers promising pedagogical possibilities for the Makassar context, where students naturally draw upon multiple linguistic resources to construct meaning and communicate effectively. Pedagogical approaches that allow strategic code-switching, encourage multilingual meaning-making processes, and explicitly connect languages through contrastive analysis and translation activities show significant potential for enhancing both Indonesian and English language development.

The integration of local cultural content within communicative language teaching frameworks presents both opportunities and implementation challenges (Fernández et al., 2023). Students demonstrate higher motivation and engagement when language learning activities incorporate familiar cultural contexts, traditional knowledge systems, and community-based learning opportunities. However, achieving this integration requires extensive faculty development, resource creation, and ongoing community partnerships that extend beyond traditional university boundaries (Farias-Gaytan et al., 2023).

3.2.2 Digital Transformation and Hybrid Learning Models

The COVID-19 pandemic has fundamentally altered language education paradigms, accelerating digital transformation while revealing both the potential and limitations of technology-mediated learning (Mohamed Hashim et al., 2022). The research findings suggest that purely online approaches cannot adequately address the complex interpersonal and cultural dimensions of language learning in multilingual contexts, while purely face-to-face approaches fail to leverage the powerful individualization, resource access, and global connectivity that digital technologies provide. The hybrid learning model that emerges from this analysis combines the best elements of online and offline instruction while addressing the specific needs of multilingual learners in developing country contexts. The 40% online component focuses on individualized skill development, multimedia content delivery,

and extended practice opportunities that allow students to progress at their own pace and access resources beyond traditional classroom limitations (Timotheou et al., 2023).

The 60% face-to-face component emphasizes interpersonal communication, cultural grounding, collaborative learning, and real-time feedback that are essential for developing communicative competence and maintaining cultural identity connections. This component also addresses equity concerns by ensuring that all students have access to high-quality instruction regardless of their individual technological resources or home internet connectivity. The integration of virtual exchange programs, online tandem learning partnerships, and digital storytelling projects provides authentic contexts for international communication while maintaining connections to local cultural practices and community needs. These hybrid approaches offer scalable solutions for expanding global connectivity without requiring extensive travel or financial resources that may be inaccessible to many students.

3.2.3 Faculty Development and Institutional Capacity Building

The statistical analysis identifying faculty quality as the strongest predictor of language learning success underscores the critical importance of comprehensive faculty development programs that address multiple competency domains simultaneously. Effective language instruction in multilingual, technologically mediated contexts requires faculty who possess not only advanced linguistic competencies but also sophisticated understanding of multilingual pedagogy, technology integration strategies, and culturally responsive teaching practices (Khoza & Mpungose, 2022). Professional development programs must address the digital competency gaps that emerged during the pandemic while simultaneously building pedagogical expertise in multilingual education approaches (Deroncele-Acosta et al., 2023). Faculty need training in online pedagogy, educational technology tools, and digital resource creation alongside deeper understanding of how to leverage students' multilingual competencies and cultural knowledge in language learning activities.

The development of culturally responsive teaching competencies requires ongoing engagement with local communities, traditional knowledge holders, and cultural leaders who can provide authentic insights into how academic language learning can honor and incorporate local wisdom traditions (Hidayat et al., 2022). This community engagement approach recognizes that effective language education extends beyond university boundaries to encompass broader social and cultural networks that shape students' identities and learning experiences. Mentorship programs that pair experienced faculty with newcomers provide essential support for navigating the complex demands of multilingual language instruction. These relationships facilitate knowledge transfer, collaborative curriculum development, and ongoing professional support that can significantly improve teaching effectiveness and job satisfaction. However, mentorship programs must be carefully structured to ensure that they promote innovation and adaptation rather than simply reproducing existing practices (Wu, 2020).

3.2.4 Curriculum Innovation and Assessment Reform

The findings reveal significant gaps between current curriculum structures and the complex linguistic competencies required for academic and professional success in globalized contexts. Traditional curriculum models that treat languages as separate subjects fail to capitalize on the natural connections and transfer possibilities that exist between Indonesian, English, and regional languages in students' multilingual repertoires. Integrated curriculum approaches that explicitly connect language learning across linguistic boundaries show promise for enhancing both efficiency and effectiveness in multilingual education (Hardiansyah et al., 2024). These approaches involve coordinated planning across language departments, shared thematic content that allows students to explore topics from multiple linguistic perspectives, and assessment strategies that recognize and reward multilingual competencies rather than penalizing linguistic transfer or code-switching behaviors.

Content and Language Integrated Learning (CLIL) methodologies offer particular potential for the Makassar context, where students must develop sophisticated academic language competencies in both

Indonesian and English while engaging with disciplinary content in fields such as engineering, medicine, agriculture, and social sciences. CLIL approaches that strategically alternate between Indonesian and English instruction can provide authentic contexts for academic language use while building content knowledge and critical thinking skills. Assessment reform represents a critical component of curriculum innovation, requiring development of evaluation strategies that accurately measure multilingual competencies while providing useful feedback for learning improvement (Simonova et al., 2019). Traditional assessment approaches that focus primarily on grammatical accuracy and formal correctness may fail to capture students' communicative effectiveness, cultural competence, and strategic multilingual abilities that are essential for real-world language use. Portfolio-based assessment systems that document language development over time through multiple modalities and contexts provide more comprehensive and authentic evaluation of student progress. These systems can incorporate traditional tests alongside projects, presentations, community engagement activities, and self-reflection exercises that demonstrate students' growing competence in using languages for meaningful purposes.

3.2.5 Technology Integration and Digital Equity

The research findings highlight both the transformative potential and significant challenges involved in integrating technology into multilingual language education. While digital technologies offer unprecedented opportunities for accessing authentic materials, connecting with global communities, and individualizing instruction, they also create new forms of inequality and exclusion that disproportionately affect students from economically disadvantaged backgrounds. Digital equity initiatives must address not only access to devices and internet connectivity but also the sophisticated digital literacy competencies required for effective online language learning (Yang et al., 2023). Many students possess basic social media and entertainment-oriented technology skills but lack the academic digital literacy necessary for engaging with online learning platforms, conducting digital research, and producing multimedia language learning projects. The integration of mobile learning technologies shows particular promise for addressing equity concerns, given the widespread availability of smartphones and mobile internet access among university students. Mobile learning applications that function effectively with limited bandwidth and provide offline capabilities can extend learning opportunities beyond traditional classroom and computer laboratory constraints (Mohamed Hashim et al., 2022).

However, successful mobile learning implementation requires careful attention to pedagogical design principles that capitalize on mobile technologies' unique affordances while addressing their limitations. Effective mobile language learning experiences involve bite-sized learning modules, multimedia content, social interaction features, and progress tracking systems that motivate sustained engagement and provide meaningful feedback on learning development.

4. CONCLUSION

This comprehensive investigation of language education transformation in Makassar's higher education institutions reveals a complex landscape of challenges and opportunities that reflect broader tensions between globalization and cultural preservation, technological innovation and educational equity, and international competitiveness and local relevance. The research demonstrates that multilingual education in developing country contexts requires sophisticated approaches that honor linguistic diversity while building globally competitive competencies. The statistical findings confirm that faculty quality represents the most critical factor in determining language learning success, with effect sizes that dwarf infrastructure, technology, or student background factors. This finding underscores the central importance of investing in comprehensive faculty development that addresses pedagogical expertise, cultural competence, and technological proficiency simultaneously. The persistent challenges in productive language skills, particularly speaking and academic writing, reflect systemic issues that extend beyond individual student deficiencies to encompass pedagogical

approaches, curriculum structures, and institutional cultures that may inadvertently limit opportunities for authentic language use and meaningful communication practice. The remarkable linguistic diversity of the student population represents both a significant asset and a complex pedagogical challenge. Students' multilingual competencies provide cognitive advantages and cultural resources that can enhance language learning when properly leveraged, but traditional monolingual pedagogical approaches fail to capitalize on these advantages and may actually inhibit optimal learning outcomes.

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