

Multilingualism, Translation, and Language Technologies in Multicultural and Low-Resource Contexts: A Systematic Literature Review

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ABSTRACT

The increasing interconnectedness of global societies has intensified the importance of multilingualism, translation, and language technologies in facilitating communication across diverse linguistic and cultural contexts. Simultaneously, advances in artificial intelligence and natural language processing have accelerated the development of language technologies aimed at addressing challenges associated with multilingual and low-resource language environments. Despite growing scholarly attention, research in these areas remains fragmented across disciplines such as sociolinguistics, translation studies, language education, and computational linguistics. Therefore, this systematic literature review (SLR) aims to synthesize current knowledge and identify emerging trends related to multilingualism, translation, and language technologies in multicultural and low-resource contexts. Guided by the PRISMA framework and informed by the PICo approach, the review analyzed 38 peer-reviewed studies published between 2021 and 2026 retrieved from the Scopus and Web of Science databases. The findings revealed four major themes: (1) Multilingualism, Language Identity, and Language Learning; (2) Translation, Transliteration, and Cross-Cultural Communication; (3) Low-Resource Language Technologies and Machine Translation Innovation; and (4) Sociocultural, Historical, and Applied Language Studies. The review highlights the continued significance of multilingual practices in identity formation and language learning, the role of translation in mediating intercultural communication, and the growing influence of artificial intelligence in improving accessibility for low-resource languages. Furthermore, the findings indicate a research imbalance, with technology-focused studies dominating the literature while sociocultural and historical perspectives remain comparatively underexplored. This review contributes to the development of an integrated understanding of language, culture, and technology and offers directions for future research and practice in multilingual and low-resource settings.

Keywords: Multilingualism, Translation and Transliteration, Language Technologies, Low-Resource Languages, Cross-cultural Communication

INTRODUCTION

Background of the study

In today's increasingly interconnected world, multilingualism, translation, and language technologies play a crucial role in facilitating communication across diverse linguistic and cultural communities. Globalization, migration, digital transformation, and the growth of international education have contributed to the emergence of multilingual societies where individuals frequently navigate multiple languages in academic, professional, and social settings. Within this context, multilingualism extends beyond language proficiency and becomes closely associated with identity formation, cultural preservation, and language learning. Simultaneously, translation and

transliteration have become essential mechanisms for promoting cross-cultural communication and enabling the transfer of knowledge across linguistic boundaries. Recent studies by Gu and Coluzzi (2025), Nah et al. (2021), Zhu and Ang (2025a, 2025b), and Mohammad Sauffi et al. (2026) demonstrate the significance of multilingual practices, language identity, and translation in multicultural environments. Moreover, rapid developments in artificial intelligence, machine translation, and natural language processing have expanded opportunities for supporting communication in low-resource language contexts, as highlighted by Zheng et al. (2024), Wongso et al. (2023), Hlaing et al. (2022), and Islam et al. (2021).

Statement of Problem

Despite the growing body of research in these areas, existing studies remain fragmented across distinct disciplinary domains, including sociolinguistics, translation studies, language education, and computational linguistics. While numerous studies investigate multilingualism and language learning, others focus exclusively on translation practices or machine translation technologies, often without considering the interconnected nature of these phenomena. Furthermore, research addressing sociocultural, historical, and applied language perspectives remains comparatively limited, creating an imbalance in the current knowledge base. The thematic analysis conducted in this review revealed that studies on low-resource language technologies dominate the literature, whereas sociocultural and historical investigations remain underrepresented. Consequently, there is a lack of comprehensive synthesis that integrates multilingualism, translation, language technologies, and sociocultural language practices within a single analytical framework.

Research Gap

To address this gap, the present systematic literature review synthesizes evidence from 38 studies published between 2021 and 2026 using the PRISMA framework. By examining the intersections among multilingualism, translation, language technologies, and sociocultural language applications, this review provides a comprehensive understanding of current research trends, theoretical foundations, and emerging directions in multicultural and low-resource contexts. The findings are expected to contribute to theory development, educational practice, translation studies, and language technology innovation while identifying areas that warrant further scholarly attention.

Research Questions

Research questions are important to a systematic literature review (SLR). The questions provide the foundation and direction for the entire review process. A well-defined research question ensures that the literature search is exhaustive and systematic, covering all relevant studies that address key aspects of the topic (Kitchenham, 2007). The research questions in this SLR are formulated based on the PICO framework. This framework is a mnemonic style used to formulate research questions, particularly in qualitative research, proposed by Lockwood et al. (2015). PICO stands for Population, Interest, and Context. This SLR is done to answer the four research questions below;

RQ1

How do multilingualism, language identity, and language learning practices influence language use, maintenance, and acquisition in multilingual and multicultural contexts?

RQ2

What translation and transliteration approaches are employed to facilitate cross-cultural communication, and how do they influence meaning transfer, cultural representation, and audience comprehension?

RQ3

What technological approaches and innovations have been developed to improve machine translation and language processing for low-resource and multilingual languages?

RQ4

How are language practices shaped by sociocultural, historical, and institutional factors, and what roles do they play in communication, identity formation, and societal development?

LITERATURE REVIEW

Theoretical Framework

Sociocultural Theory (SCT) by Vygotsky (1978) that supports Multilingualism, Language Identity, and Language Learning

Sociocultural Theory (SCT), proposed by Vygotsky (1978), emphasizes that learning is fundamentally a social process that develops through interaction with others and participation in culturally meaningful activities. According to SCT, cognitive development does not occur in isolation; rather, it is mediated by language, social relationships, and cultural tools within a specific socio-cultural environment. Language serves as the primary mediating tool through which individuals construct knowledge, negotiate meaning, and develop higher-order thinking skills. From this perspective, multilingualism is not merely the acquisition of multiple linguistic systems but a dynamic process shaped by continuous social interaction and engagement with diverse linguistic communities. SCT provides a strong theoretical foundation for understanding the relationship between multilingualism, language identity, and language learning. Multilingual learners draw upon their linguistic and cultural resources when interacting with peers, teachers, family members, and wider communities, enabling them to co-construct knowledge and develop communicative competence. Furthermore, language identity is formed and negotiated through these social interactions, as individuals use different languages to express cultural affiliation, personal experiences, and social belonging. In multilingual contexts, learners actively leverage their entire linguistic repertoire to support learning, reinforce identity, and participate effectively in academic and social environments. Thus, SCT explains how multilingualism, language identity, and language learning are interconnected through socially mediated processes and cultural participation.

Skopos Theory by Vermeer (1989) that supports Translation, Transliteration, and Cross-Cultural Communication

Skopos Theory, introduced by Hans J. Vermeer (1989), is one of the most influential functionalist theories in translation studies. The theory argues that the primary determinant of any translation is its purpose (skopos) within the target context rather than strict linguistic equivalence to the source text. According to Vermeer, translators should make translation decisions based on the intended function of the translated text, the needs of the target audience, and the sociocultural environment in which the translation will be received. This perspective is particularly relevant to studies of translation, transliteration, and cross-cultural communication, as successful communication often requires adaptation beyond literal word-for-word transfer. In multilingual and multicultural settings, translators frequently negotiate linguistic and cultural differences to ensure that messages are meaningful, accessible, and culturally appropriate for target readers. Similarly, transliteration practices may be modified to preserve cultural identity while facilitating understanding among audiences unfamiliar with the source language. Skopos Theory therefore provides a useful framework for explaining how translation and transliteration serve as strategic tools for intercultural mediation. By prioritizing communicative effectiveness and cultural relevance, the theory highlights the role of translation in bridging linguistic boundaries, facilitating cross-cultural understanding, and enabling the transfer of cultural meanings across diverse communities.

Statistical Machine Translation (SMT) Theory by Koehn (2010) that supports Low-Resource Language Technologies and Machine Translation Innovation

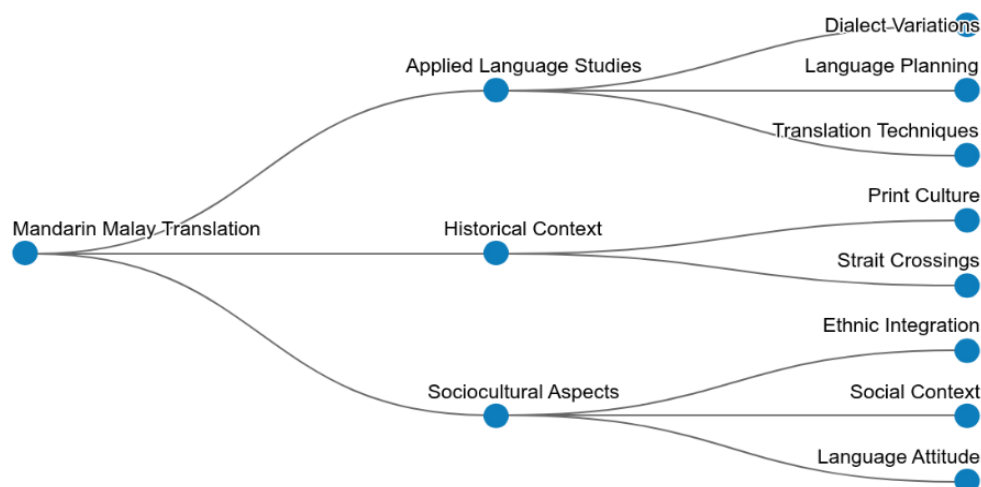
Statistical Machine Translation (SMT) Theory, as comprehensively described by Koehn (2010), is a data-driven approach to machine translation that relies on statistical models derived from large bilingual corpora to generate translations between languages. Unlike rule-based translation systems, which depend on manually crafted

linguistic rules, SMT learns translation patterns, word alignments, and language probabilities from existing parallel texts. The core principle of SMT is to identify the most probable target-language sentence based on the source-language input and statistical evidence from training data. Although recent advances in Neural Machine Translation (NMT) have largely surpassed SMT in translation quality, SMT remains an important theoretical foundation for understanding contemporary machine translation systems and addressing challenges in low-resource language settings. In the context of low-resource language technologies and machine translation innovation, SMT is particularly relevant because it offers effective translation solutions when large-scale annotated datasets required by deep learning models are unavailable. Many studies on low-resource languages utilize SMT frameworks, bilingual lexicons, and parallel corpora to improve translation performance and preserve linguistic diversity. Furthermore, SMT has contributed significantly to the development of multilingual corpora, language modeling techniques, and translation evaluation methods that continue to inform modern machine translation research. Therefore, SMT Theory provides a valuable foundation for understanding how computational approaches support language accessibility, digital inclusion, and technological innovation for under-resourced languages.

Social Constructionism Theory by Berger & Luckmann (1966) that supports Sociocultural, Historical, and Applied Language Studies

Social Constructionism Theory, developed by Berger and Luckmann (1966), posits that reality is socially constructed through human interaction, shared meanings, and collective experiences. According to this theory, knowledge, beliefs, identities, and social institutions are not inherently fixed or objective; rather, they are created, maintained, and transformed through continuous social processes. Language plays a central role in this construction because it serves as the primary medium through which individuals communicate, interpret experiences, and negotiate meanings within society. Social Constructionism provides a valuable theoretical foundation for Sociocultural, Historical, and Applied Language Studies because it explains how language both reflects and shapes social realities across different historical and cultural contexts. In sociocultural settings, language contributes to the formation of identities, social norms, and cultural values, while in historical contexts it helps preserve collective memories and transmit ideologies across generations. The theory is also relevant to applied language studies, where language is used in institutions such as healthcare, education, government, and religious organizations to construct shared understandings and influence social behavior. Furthermore, historical language practices, intercultural interactions, and institutional communication can be viewed as products of socially negotiated meanings embedded within specific cultural and temporal contexts. Therefore, Social Constructionism highlights the dynamic relationship between language, society, culture, and history, making it highly relevant for understanding the broader societal functions of language.

CONCEPTUAL FRAMEWORK



The conceptual framework for this systematic literature review (SLR), titled “Multilingualism, Translation, and Language Technologies in Multicultural and Low-Resource Contexts: A Systematic Literature Review,” is anchored in four complementary theoretical perspectives that collectively explain the social, cultural, communicative, and technological dimensions of language. As illustrated in the conceptual framework, multilingual communication is positioned as the central phenomenon connecting language learning, translation practices, technological innovation, and broader sociocultural applications. The first pillar of the framework is Sociocultural Theory (SCT) proposed by Vygotsky (1978), which emphasizes that language learning and cognitive development occur through social interaction and cultural participation. This theory supports the theme of Multilingualism, Language Identity, and Language Learning by explaining how individuals construct linguistic knowledge, negotiate identities, and utilize multilingual repertoires within educational and social environments. Through interactions with families, communities, and institutions, learners develop language competencies that contribute to both communication and identity formation in multicultural societies.

The second pillar is Skopos Theory developed by Vermeer (1989), which explains that translation strategies are determined by the purpose and function of a translated text within a target context. This perspective underpins the theme of Translation, Transliteration, and Cross-Cultural Communication, highlighting how translation serves as a bridge between languages and cultures. The third theoretical foundation is Statistical Machine Translation (SMT) Theory proposed by Koehn (2010), which provides a basis for understanding computational approaches to multilingual communication and low-resource language technologies. SMT supports research on machine translation, speech translation, corpus development, and multilingual artificial intelligence systems designed to improve communication across linguistic boundaries. Finally, Social Constructionism Theory by Berger and Luckmann (1966) supports the theme of Sociocultural, Historical, and Applied Language Studies by viewing language as a social construct that shapes and reflects historical experiences, cultural practices, institutional interactions, and community development. Together, these four theories form an integrated framework demonstrating how multilingualism, translation, and language technologies operate within broader sociocultural and historical contexts, thereby providing a comprehensive lens for synthesizing the findings of the reviewed studies.

MATERIAL AND METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework is widely recognized as a standard guideline for conducting systematic literature reviews (SLRs), as it promotes transparency, consistency, and comprehensiveness throughout the review process (Page et al., 2021). The framework provides researchers with a structured approach to systematically identify, screen, assess, and include relevant studies in a review. In this SLR, the authors served as researchers and collaboratively evaluated articles relevant to the study topic. Two major academic databases, Web of Science and Scopus, were selected due to their extensive coverage of high-quality scholarly publications and their reliability in supporting systematic review research.

The PRISMA framework consists of five key stages: (i) identification, (ii) screening, (iii) eligibility, (iv) data abstraction and analysis, and (v) quality appraisal. During the identification stage, comprehensive searches are conducted across selected databases to locate potentially relevant studies. The screening stage involves reviewing titles, abstracts, and other relevant information against predefined inclusion and exclusion criteria to remove irrelevant studies. In the eligibility stage, the full texts of the remaining articles are examined to ensure they meet the established criteria for inclusion. Subsequently, data abstraction and analysis are performed to extract, organize, and synthesize relevant information from the selected studies. Finally, the quality appraisal stage assesses the methodological rigor and credibility of the included studies. By following this structured and systematic process, the review ensures methodological rigor and minimizes bias, thereby producing reliable findings that can inform future research and practical applications.

Identification

In line with the PRISMA framework, the identification stage serves as a fundamental starting point in the systematic literature review process, ensuring comprehensive coverage of relevant studies while minimizing the potential for selection bias. In the present study, a systematic search was performed using two major bibliographic databases, Scopus and Web of Science (WoS), with the keywords “*multilingualism*,” “*translation*,” and “*low-resource language*.” The search string used is presented in Table 1.

Scopus and WoS were selected due to their broad multidisciplinary scope, rigorous indexing standards, and extensive inclusion of high-quality, peer-reviewed publications. The search yielded 164 records from Scopus and 100 records from Web of Science, resulting in a total of 264 records before duplicate removal.

The larger number of records retrieved from Scopus is likely attributable to its wider journal coverage, particularly in the social sciences, whereas WoS contributed a more focused collection of highly cited and methodologically robust studies. As illustrated in Table 1, the identification of 264 records demonstrates the increasing scholarly attention devoted to multilingualism and translation and reflects the diverse range of perspectives underpinning this area of research, including linguistic, pedagogical, and psychological dimensions. The inclusion of multiple databases strengthened the methodological rigor of the review by reducing database-specific bias and improving the representation of different research traditions and geographical contexts. Furthermore, the carefully constructed search strategy enhanced sensitivity to variations in terminology while maintaining consistency with the objectives of the review. Overall, this transparent and systematic identification process provides a solid foundation for the subsequent screening and eligibility phases, in accordance with PRISMA guidelines and the principles of rigorous and replicable research.

Table 1 The search string

Scopus	TITLE-ABS-KEY ((multilingualism OR "language identity" OR " heritage language" OR "language learning") AND (translation OR transliteration OR "cross-cultural communication" OR "machine translation" OR "speech translation") AND (low-resource language" OR "under-resourced language" OR "language technology" OR "multilingual NLP" OR "natural language processing")))
Web of Science	TITLE-ABS-KEY ((multilingualism OR "language identity" OR " heritage language" OR "language learning") AND (translation OR transliteration OR "cross-cultural communication" OR "machine translation" OR "speech translation") AND (low-resource language" OR "under-resourced language" OR "language technology" OR "multilingual NLP" OR "natural language processing"))) Extracted July 2026

Screening

During the screening phase of the systematic literature review, the retrieved studies were assessed for their relevance and alignment with the four predefined research questions. This stage aimed to refine the initial set of records by removing duplicate entries and applying established inclusion and exclusion criteria. After the screening process, 224 publications were excluded because they did not meet the study's scope and relevance requirements, leaving 40 articles for further evaluation (Scopus = 19; Web of Science = 21), as illustrated in Figure 1.

The selection process prioritized scholarly literature that provided substantial theoretical or empirical contributions to the review topic. Consequently, sources such as book reviews, book series, meta-syntheses, meta-analyses, and book chapters that were not directly relevant to the focus of the study were excluded. To ensure consistency and relevance to current academic discussions, only peer-reviewed articles and proceedings published in English between 2021 and 2026 were considered eligible for inclusion.

Furthermore, a duplication screening confirmed that no duplicate records were identified across the two databases. By employing a systematic and criteria-based screening procedure, the study strengthened the quality and relevance of the evidence base, ensuring that only the most pertinent and methodologically rigorous publications advanced to the subsequent stages of eligibility assessment and analysis.

Overall, this screening process enhanced the transparency, reliability, and focus of the review, in line with PRISMA recommendations and best practices for conducting systematic literature reviews.

Eligibility

For the third step, known as eligibility, a total of 40 articles have been prepared. All articles' titles and key content were thoroughly reviewed at this stage to ensure that the inclusion requirements were fulfilled and fit into the present study with the current research aims. Therefore, two reports were omitted because they were not pure science articles based on empirical evidence. Finally, 38 articles are available for review (see Table 2).

Table 2 Selection Criteria for Study Inclusion and Exclusion

Criterion	Inclusion	Exclusion
Language	English	Non-English
Publication Period	2021 – 2026	Before 2021
Literature type	Journal articles, peer-reviewed conference proceedings	Editorials, book reviews, abstracts without full papers, non-scholarly items
Publication Stage	Final	In Press
Topic	Multilingualism, translation, transliteration, multilingual NLP, machine translation, speech translation, language technologies, language identity, sociocultural language practices	Studies unrelated to review objectives

Data Abstraction and Analysis

An integrative analysis approach was employed in this study to examine and synthesize findings from diverse research methodologies, including quantitative, qualitative, and mixed-methods studies. To generate meaningful themes, the authors systematically reviewed 38 selected publications and extracted relevant data related to the research objectives. Particular attention was given to the methodological approaches and key findings of studies addressing multilingualism, translation and language technologies.

The thematic development process was conducted collaboratively by the authors, who identified and refined themes based on patterns and evidence emerging from the literature. Throughout the analysis, detailed records were maintained to document interpretations, analytical reflections, and emerging insights. To ensure consistency and reliability in theme construction, the authors compared their analyses and resolved discrepancies through discussion and consensus.

Furthermore, an expert review stage was undertaken to validate the identified themes and subthemes. This process ensured that each theme was conceptually clear, relevant, and appropriately represented the evidence synthesized from the selected studies. The systematic and collaborative nature of this integrative analysis enhanced the credibility, rigor, and trustworthiness of the findings, providing a comprehensive understanding of the relationships between multilingualism, translation and language technologies in multicultural and low resource context.

Quality of Appraisal

According to Kitchenham and Charters (Kitchenham, 2007), the researchers need to assess the quality of the research chosen. The next stage is applying quality assessment suggested by Abouzahra et al., (2020), which consist of six questions complying to a scoring procedure for evaluating each criterion. The possible ratings are "Yes" (Y) with a score of 1 if the criterion is fully met, "Partly" (P) with a score of 0.5 if the criterion is somewhat met but contains some gaps or shortcomings, and "No" (N) with a score of 0 if the criterion is not met at all.

Table 3 Possible ratings for 6 question by Abouzahra et al., (2020),

No	Question
QA1	Is the purpose of the study clearly stated?
QA2	Is the interest and the usefulness of the work clearly presented?
QA3	Is the study methodology clearly established?
QA4	Are the concepts of the approach clearly defined?
QA5	Is the work compared and measured with other similar work?
QA6	Are the limitations of the work clearly mentioned?

Each writer independently assesses the study according to these criteria, and the scores are then totalled across all experts to determine the overall mark. For a study to be accepted for the next process, the total mark, derived from summing the scores from all three experts, must exceed 3.0. This threshold ensures that only studies meeting a certain quality standard proceed further. Studies scoring below 3.0 were reviewed collectively and retained only when considered important for thematic completeness, historical relevance, or emerging research areas. Any scoring disagreements were resolved through discussion and consensus. The results are shown in Table 4.

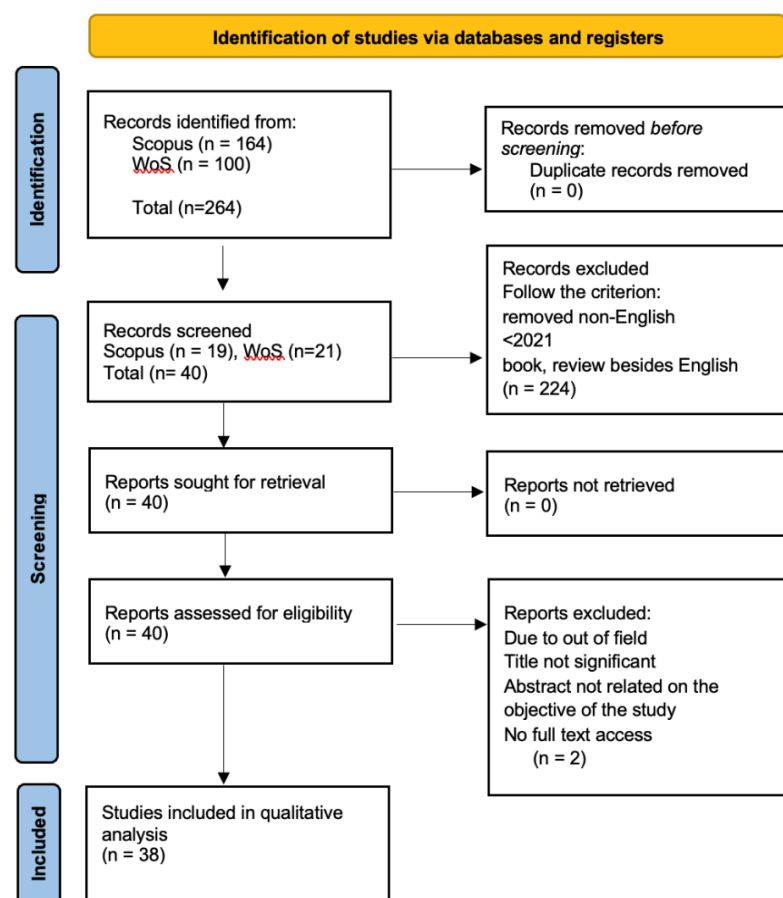


Figure 1 PRISMA 2020 flow diagram illustrating study identification, screening, eligibility assessment, and inclusion process (Page et al., 2021)

RESULT AND FINDING

Quality of Assessment

Table 4 shows the result of the assessment performance for selected primary studies. The overall quality of the articles is as follows;

High quality ($\geq 80\%$): Majority of studies

Moderate quality (60–79%): Conceptual or descriptive studies

Lower quality ($<60\%$): Primarily survey-only or exploratory abstracts

Table 4 Quality of Assessment for the selected 38 papers

Study	Author(s) & Year	Article Title	QA1	QA2	QA3	QA4	QA5	QA6	Total	%
PS1	Gu & Coluzzi (2025)	Presence of ARABIC in Kuala Lumpur's multilingual linguistic landscape	Y	Y	Y	Y	N	N	4.0	66.7
PS2	Zhu & Ang (2025)	Confusion or fusion? Cultural diversity in cosmopolitan translation	Y	Y	Y	Y	N	N	4.0	66.7
PS3	Nah et al. (2021)	Multilingualism among the elderly Chinese in Singapore	Y	Y	Y	P	N	N	3.5	58.3
PS4	Hardini et al. (2023)	ASEAN Students Interest in Learning Indonesian Language	Y	Y	Y	P	N	P	4.0	66.7
PS5	Musaev et al. (2021)	Translation and Linguistic Strategies of English Oxymora	Y	Y	Y	Y	N	P	4.5	75.0
PS6	Mohammad Sauffi et al. (2026)	Translanguaging and identity preservation	Y	Y	Y	Y	N	N	4.0	66.7
PS7	Chow (2024)	Impact caption translation on a streaming media platform	Y	Y	Y	Y	P	Y	5.5	91.7
PS8	Vaingankar et al. (2021)	PMHI translations validation	Y	Y	Y	Y	Y	N	5.0	83.3
PS9	Peng (2025)	Factors Influencing Malay Language Learning	Y	Y	Y	Y	Y	N	5.0	83.3
PS10	Lau et al. (2024)	Human vs ChatGPT translation accuracy	Y	Y	Y	P	Y	P	4.5	75.0
PS11	Shaharuddin et al. (2026)	Barriers to health care utilisation	Y	Y	Y	Y	Y	N	5.0	83.3
PS12	Zhu & Ang (2025)	Culture Reflected in Transliteration	Y	Y	Y	Y	N	N	4.0	66.7
PS13	Mukundan (2023)	Review of Materials Development	Y	Y	P	P	N	P	3.0	50.0
PS14	Park & Peck (2022)	Beneficial Effect of Multilingualism in L3	Y	Y	Y	Y	P	N	4.5	75.0

PS15	Koh et al. (2021)	Mandarin Fever in Brunei	Y	Y	Y	Y	N	Y	5.0	83.3
PS16	Tham et al. (2026)	Reception study on subtitled Chinese movies	Y	Y	Y	Y	Y	N	5.0	83.3
PS17	Gu (2023)	Three global cities Covidscapes	Y	Y	Y	Y	P	P	5.0	83.3
PS18	Laamann (2022)	Protestant Missions to South-East Asia	P	P	P	P	N	N	2.0	33.3
PS19	Zheng et al. (2024)	Improving Low-Resource Machine Translation	Y	Y	Y	Y	Y	N	5.0	83.3
PS20	Das et al. (2025)	IWSLT 2025 Indic ST	Y	Y	P	P	N	N	3.0	50.0
PS21	Singh et al. (2024)	IWSLT 2024 Indic ST	Y	Y	P	P	N	N	3.0	50.0
PS22	Rao et al. (2022)	Punctuation Restoration	Y	Y	Y	Y	Y	N	5.0	83.3
PS23	Ding & Goh (2024)	Translingual Practice and Heritage Languages	Y	Y	Y	Y	P	N	4.5	75.0
PS24	Sujaini et al. (2023)	Language Model Role in MT Accuracy	Y	Y	Y	Y	Y	P	5.5	91.7
PS25	Wongso et al. (2023)	Many-to-Many Multilingual Translation Model	Y	Y	Y	Y	Y	P	5.5	91.7
PS26	Hlaing et al. (2022)	Improving NMT with POS-tag Features	Y	Y	Y	Y	Y	N	5.0	83.3
PS27	Bang et al. (2023)	English-Korean Speech Translation Corpus	Y	Y	Y	Y	P	N	4.5	75.0
PS28	Nguyen et al. (2022)	KC4MT Corpus	Y	Y	Y	Y	P	N	4.5	75.0
PS29	Lee et al. (2023)	Translation Norms for Malay and English Words	Y	Y	Y	Y	Y	N	5.0	83.3
PS30	Bei et al. (2021)	GTCOM NMT Systems for WMT21	Y	Y	Y	P	Y	N	4.5	75.0
PS31	Dinh & Thanh (2022)	Cross-language Paraphrase Identification	Y	Y	Y	Y	Y	N	5.0	83.3
PS32	Islam et al. (2021)	Rule-Based and Neural MT Blending	Y	Y	Y	Y	Y	P	5.5	91.7
PS33	Kunchukuttan et al. (2021)	Neural Machine Transliteration Indic	Y	Y	Y	Y	P	N	4.5	75.0
PS34	Parida et al. (2021)	NLP Hut Participation at WAT2021	Y	Y	Y	Y	Y	N	5.0	83.3
PS35	Gopalakrishnan & Sudeep (2025)	Image Generation Using Indian Languages	Y	Y	Y	Y	Y	N	5.0	83.3
PS36	Pushpananda et al. (2024)	TamSiPara Corpus	Y	Y	Y	Y	P	N	4.5	75.0
PS37	Choi & Ko (2023)	Resyllabification Errors by Vietnamese Learners	Y	Y	Y	Y	P	N	4.5	75.0
PS38	Hu & Kubler (2021)	Investigating translated Chinese using machine learning	Y	Y	Y	Y	Y	N	5.0	83.3

The quality assessment results indicate that the majority of the selected studies demonstrate moderate to high methodological quality, suggesting that they provide reliable evidence for the systematic literature review. Most articles obtained scores between 4.0 and 5.5 (66.7%-91.7%), reflecting clearly stated research objectives, well-defined methodologies, and explicit conceptual frameworks. Several studies, including Chow (2024), Sujaini et al. (2023), Wongso et al. (2023), and Islam et al. (2021), achieved the highest score of 5.5 (91.7%), indicating strong fulfilment of almost all quality assessment criteria. Many machine translation and language technology studies also scored highly due to their rigorous experimental designs and comparisons with existing approaches. However, lower scores were observed for studies such as Laamann (2022) and Mukundan (2023), mainly because the abstracts provided limited information regarding methodological procedures, comparisons with related works, and research limitations. Across the dataset, QA1 (purpose), QA2 (significance), and QA3 (methodology) were generally well addressed, whereas QA5 (comparison with similar studies) and QA6 (limitations) were less frequently reported in the abstracts. Overall, the findings suggest that the included studies possess sufficient quality for inclusion in the SLR and provide a robust foundation for synthesizing evidence on multilingualism, translation, language technologies, and sociocultural language studies.

Themes

Table 5- Analysis for Themes

Theme	Number of Studies
Theme 1: Multilingualism, Language Identity, and Language Learning	11
Theme 2: Translation, Transliteration, and Cross-Cultural Communication	10
Theme 3: Low-Resource Language Technologies and Machine Translation Innovation	15
Theme 4: Sociocultural, Historical, and Applied Language Studies	2
Total	38 Studies

The thematic distribution of the 38 selected studies reveals a strong research emphasis on low-resource language technologies and machine translation innovation, which accounts for the largest proportion of the literature with 15 studies. This finding reflects the growing scholarly interest in artificial intelligence, machine translation, multilingual natural language processing, and digital solutions for under-resourced languages. The second largest theme, Multilingualism, Language Identity, and Language Learning, consists of 11 studies, highlighting the continued importance of multilingual practices, language maintenance, identity formation, and language education in multicultural societies. Similarly, Translation, Transliteration, and Cross-Cultural Communication comprises 10 studies, demonstrating substantial attention to translation strategies, cultural mediation, transliteration practices, and intercultural understanding across languages. In contrast, Sociocultural, Historical, and Applied Language Studies is represented by only 2 studies, indicating that this area remains relatively underexplored within the selected literature. Overall, the thematic distribution suggests that current research trends are increasingly driven by technological innovation while maintaining significant interest in multilingual communication, language learning, and cross-cultural interaction.

Theme 1 (T1): Multilingualism, Language Identity, and Language Learning in Multicultural Societies

No.	Author(s) & Year	Article Title
T1-1	Gu & Coluzzi (2025)	Presence of 'ARABIC' in Kuala Lumpur's multilingual linguistic landscape: heritage, religion, identity, business and mobility
T1-2	Nah et al. (2021)	Multilingualism among the elderly Chinese in Singapore: An oral account
T1-3	Hardini et al. (2023)	ASEAN Students' Interest in Learning the Indonesian Language: A Descriptive Study from the Perspective of SEAMEO ASEAN

T1-4	Mohammad Sauffi et al. (2026)	Translanguaging and identity preservation in English language learning: multilinguals' voices from a Malaysian University
T1-5	Peng (2025)	Factors Influencing Malay Language Learning among Malaysian Chinese Independent Secondary School Students
T1-6	Mukundan (2023)	A Review of Materials Development in Multi-Cultural Developing World L2 Contexts
T1-7	Park & Peck (2022)	Beneficial effect of multilingualism in resolving L3 structural complexity: Attention shift from familiar cue to critical cue
T1-8	Koh et al. (2021)	"Mandarin Fever" and Chinese Language-learning in Brunei's Middle Schools: Discrepant Discourses, Multifaceted Realities and Institutional Barriers
T1-9	Gu (2023)	A tale of three global cities: A comparative account of Dubai, Kuala Lumpur and Hong Kong's multilingual repertoires evidenced in their Covidscapes as part of Covid-19 crisis and public health communication
T1-10	Ding & Goh (2024)	Translingual practice as a representation of heritage languages and regional identities in multilingual society
T1-11	Choi & Ko (2023)	Orthographic influence on resyllabification errors by Vietnamese learners of Korean: A speech corpus study

Theme 1 highlights the interconnected roles of multilingualism, language identity, and language learning within diverse sociocultural contexts across Asia, particularly in Southeast Asia. The included studies demonstrate that multilingualism is not merely a linguistic phenomenon but also a reflection of cultural heritage, identity formation, and social interaction. Gu and Coluzzi (2025) and Gu (2023) illustrate how multilingual linguistic landscapes function as markers of identity, religion, and public communication, while Nah et al. (2021) and Ding and Goh (2024) emphasize the preservation of heritage languages and the maintenance of regional identities amid globalization. In educational settings, Hardini et al. (2023), Peng (2025), and Koh et al. (2021) reveal that language learning is influenced by learners' motivations, policy environments, cultural values, and perceived socioeconomic benefits. Similarly, Mohammad Sauffi et al. (2026) demonstrate how translanguaging practices enable multilingual learners to preserve cultural identities while enhancing English language learning. Park and Peck (2022) further show that multilingual experience can facilitate the acquisition of additional languages through enhanced metalinguistic awareness. Mukundan (2023) and Choi and Ko (2023) highlight the importance of culturally responsive learning materials and linguistic influences on language acquisition. Overall, these studies collectively indicate that multilingualism, identity, and language learning are closely intertwined and shaped by social, cultural, educational, and historical factors.

Theme 2 (T2): Translation, Transliteration, and Cross-Cultural Communication

No.	Author(s) & Year	Article Title
T2-1	Zhu & Ang (2025a)	Confusion or fusion? Cultural diversity in the cosmopolitan translation of Chinese street food names in Malaysia
T2-2	Musaev et al. (2021)	Translation and Linguistic Strategies of English Oxymora into Japanese by Japanese Language Learners
T2-3	Chow (2024)	Impact caption translation on a streaming media platform: the case of a Chinese reality show
T2-4	Vaingankar et al. (2021)	Development of the Chinese, Malay and Tamil translations of the Positive Mental Health Instrument: Cross-cultural adaptation, validity and internal consistency
T2-5	Lau et al. (2024)	Comparing translation accuracy in Belt and Road Malaysia children's literature: Malay and Chinese native speakers vs ChatGPT
T2-6	Zhu & Ang (2025b)	Is Culture Reflected in Transliteration? Transliteration of Chinese Street Food Names in Malaysia

T2-7	Tham et al. (2026)	A reception study on the impact of visual elements and translation strategies on viewers' comprehension of culture-specific items in Malay-subtitled Chinese movies
T2-8	Lee et al. (2023)	Translation norms for Malay and English words: The effects of word class, semantic variability, lexical characteristics, and language proficiency on translation
T2-9	Dinh & Thanh (2022)	English-Vietnamese cross-language paraphrase identification using hybrid feature classes
T2-10	Hu & Kübler (2021)	Investigating translated Chinese and its variants using machine learning

Theme 2 focuses on translation, transliteration, and cross-cultural communication, highlighting how linguistic and cultural meanings are negotiated across different languages, contexts, and audiences. The studies collectively demonstrate that translation extends beyond the literal transfer of words to encompass the mediation of cultural identities, social values, and communicative intentions. For example, Zhu and Ang (2025a, 2025b) examine the translation and transliteration of Chinese street food names in Malaysia, revealing how multilingual and multicultural influences shape cultural representation and meaning-making. Similarly, Musaev et al. (2021) explore the challenges of translating English oxymora into Japanese, emphasizing the importance of linguistic and cultural competence in handling figurative language. In audiovisual contexts, Chow (2024) and Tham et al. (2026) show how subtitling strategies, visual elements, and multimodal resources influence audience comprehension and the communication of culture-specific meanings. Studies by Vaingankar et al. (2021) and Lee et al. (2023) highlight the significance of translation quality, equivalence, and validity in multilingual settings, while Lau et al. (2024) compare human and AI-assisted translation performance. Furthermore, Dinh and Thanh (2022) and Hu and Kübler (2021) demonstrate the growing integration of computational methods and machine learning in translation research. Overall, these studies indicate that translation and transliteration serve as critical mechanisms for facilitating intercultural understanding, preserving cultural nuances, and supporting effective communication across linguistic boundaries.

Theme 3 (T3) : Low-Resource Language Technologies and Machine Translation Innovation

No.	Author(s) & Year	Article Title
T3-1	Zheng et al. (2024)	Improving Low-Resource Machine Translation for Formosan Languages Using Bilingual Lexical Resources
T3-2	Das et al. (2025)	IWSLT 2025 Indic Track System Description Paper: Speech-to-Text Translation from Low-Resource Indian Languages (Bengali and Tamil) to English
T3-3	Singh et al. (2024)	IWSLT 2024 Indic Track System Description Paper: Speech-to-Text Translation from English to Multiple Low-Resource Indian Languages
T3-4	Rao et al. (2022)	Punctuation Restoration for Singaporean Spoken Languages: English, Malay, and Mandarin
T3-5	Sujaini et al. (2023)	Analysis of Language Model Role in Improving Machine Translation Accuracy for Extremely Low Resource Languages
T3-6	Wongso et al. (2023)	Many-to-Many Multilingual Translation Model for Languages of Indonesia
T3-7	Hlaing et al. (2022)	Improving neural machine translation with POS-tag features for low-resource language pairs
T3-8	Bang et al. (2023)	English-Korean speech translation corpus (EnKoST-C): Construction procedure and evaluation results
T3-9	Nguyen et al. (2022)	KC4MT: A High-Quality Corpus for Multilingual Machine Translation
T3-10	Bei et al. (2021)	GTCOM Neural Machine Translation Systems for WMT21
T3-11	Islam et al. (2021)	Towards achieving a delicate blending between rule-based translator and neural machine translator

T3-12	Kunchukuttan et al. (2021)	A Large-scale Evaluation of Neural Machine Transliteration for Indic Languages
T3-13	Parida et al. (2021)	NLP Hut's Participation at WAT2021
T3-14	Gopalakrishnan & Sudeep (2025)	Photo-realistic image generation using text descriptions in Indian languages: an exploration study
T3-15	Pushpananda et al. (2024)	TamSiPara: A Tamil-Sinhala Parallel Corpus

Theme 3 focuses on low-resource language technologies and machine translation innovation, highlighting the rapid advancement of artificial intelligence, natural language processing (NLP), and multilingual computational tools designed to address linguistic resource scarcity. The studies collectively emphasize the development of machine translation systems, speech translation models, language corpora, and multilingual resources for underrepresented languages. Several studies, including Zheng et al. (2024), Sujaini et al. (2023), Hlaing et al. (2022), Wongso et al. (2023), and Islam et al. (2021), investigate methods for improving machine translation performance through bilingual lexical resources, language models, linguistic features, multilingual architectures, and hybrid translation approaches. Speech translation and speech processing technologies are also prominent, as demonstrated by Das et al. (2025), Singh et al. (2024), Rao et al. (2022), and Bang et al. (2023), which seek to enhance speech-to-text translation, punctuation restoration, and multilingual speech resources. Furthermore, corpus development studies such as Nguyen et al. (2022) and Pushpananda et al. (2024) provide essential language datasets that support machine learning and translation research. Kunchukuttan et al. (2021) and Parida et al. (2021) extend innovation into transliteration and multimodal translation, while Gopalakrishnan and Sudeep (2025) demonstrate the expanding application of low-resource language technologies in text-to-image generation. Overall, these studies reveal a growing commitment to leveraging AI-driven innovations to improve language accessibility, resource development, and digital inclusion for low-resource and multilingual language communities.

Theme 4 (T4) : Sociocultural, Historical, and Applied Language Studies

No.	Author(s) & Year	Article Title
T4-1	Shaharuddin et al. (2026)	<i>Barriers to health care utilisation and coping strategies during the COVID-19 pandemic: A cross-sectional survey among the public in Malaysia</i>
T4-2	Laamann (2022)	<i>The Protestant Missions to South-East Asia: Experimental Laboratory of Missionary Concepts and of Human Relations (Circa 1780-1840)</i>

Theme 4 encompasses sociocultural, historical, and applied language studies, illustrating how language functions beyond communication to influence social practices, institutional interactions, and historical developments. Although represented by only two studies, this theme highlights the broad societal significance of language across different contexts and time periods. Shaharuddin et al. (2026) investigate barriers to healthcare utilization during the COVID-19 pandemic in Malaysia, demonstrating how communication, language accessibility, and information dissemination can directly affect public understanding, service access, and health-related decision-making. The study underscores the importance of effective multilingual communication in addressing healthcare disparities and supporting societal resilience during public health crises. In contrast, Laamann (2022) provides a historical perspective by examining Protestant missionary activities in Southeast Asia between 1780 and 1840. The study reveals how language served as a critical medium for religious outreach, intercultural interaction, and relationship-building between missionaries, colonial administrations, and local Malay and Chinese communities. Together, these studies illustrate the diverse roles of language in shaping social realities, facilitating institutional and intercultural communication, and influencing historical and contemporary societal processes. Overall, the findings suggest that language should be viewed not only as a linguistic system but also as a powerful social resource that mediates historical change, cultural interaction, public engagement, and community development.

CONCLUSION

Summary of Findings

This systematic literature review examined 38 studies published between 2021 and 2026 to synthesize the current state of knowledge on multilingualism, translation, and language technologies in multicultural and low-resource contexts. The findings revealed four dominant themes: Multilingualism, Language Identity, and Language Learning (11 studies), Translation, Transliteration, and Cross-Cultural Communication (10 studies), Low-Resource Language Technologies and Machine Translation Innovation (15 studies), and Sociocultural, Historical, and Applied Language Studies (2 studies). The review demonstrates that multilingualism continues to play a vital role in identity formation, language maintenance, and educational development, as evidenced in studies by Gu and Coluzzi (2025), Nah et al. (2021), Mohammad Sauffi et al. (2026), and Peng (2025). Similarly, translation and transliteration studies highlighted the importance of cultural mediation and audience comprehension in multilingual societies, particularly in the works of Zhu and Ang (2025a, 2025b), Chow (2024), and Tham et al. (2026). Most notably, the largest body of literature focused on low-resource language technologies, reflecting the increasing importance of artificial intelligence, machine translation, multilingual corpora, and speech translation systems in enhancing digital language accessibility and communication.

Implications and Suggestions for Future Research

The findings carry important implications for researchers, educators, translators, policymakers, and technology developers. From an educational perspective, multilingual pedagogies and translanguaging practices should be further integrated into language learning environments to support identity preservation and linguistic diversity. For translation studies, the findings reinforce the importance of culturally sensitive translation approaches that extend beyond linguistic equivalence to facilitate meaningful cross-cultural communication. Furthermore, the growth of machine translation and language technologies highlights the need for sustained investment in low-resource language resources, multilingual datasets, and inclusive AI systems to prevent linguistic marginalization. Future research should therefore investigate underrepresented sociocultural and historical dimensions of language, which were found to receive comparatively limited scholarly attention. Researchers are also encouraged to conduct longitudinal and cross-regional studies examining multilingual practices, human-AI translation collaboration, and emerging language technologies across diverse linguistic communities. Such efforts will contribute to a more comprehensive understanding of how multilingualism, translation, and technological innovation collectively shape communication, identity, and social development in an increasingly interconnected world.

LIMITATIONS OF THE REVIEW

First, only Scopus and Web of Science databases were searched, which may have excluded relevant studies indexed elsewhere. Second, only English-language publications were included, potentially underrepresenting non-English scholarship in multilingual and low-resource language contexts. Third, the selected studies employed diverse methodologies and research designs, limiting direct comparison across studies. Fourth, the final sample consisted of both sociocultural and technological studies, resulting in substantial thematic heterogeneity. Finally, search-term selection and database coverage may have contributed to the comparatively smaller number of sociocultural and historical studies identified.

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Conflicts of Interest

The authors declare that they have no conflicts of interest to report regarding the present study.

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