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## Harmonising Music and Language: Insights into Children's Language Development from Influential Research

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**Abstract.** Music has increasingly been recognised as a meaningful contributor to children's language development, due to shared cognitive and auditory mechanisms between music and language processing. However, existing research remains conceptually fragmented across disciplines. This study aims to synthesise influential scholarship and identify strategic research directions in music-enhanced language development. A dual analytical design combining bibliometric performance analysis and SWOT analysis was employed. Using the Scopus database, 224 studies published between 2021 and 2025 were identified, from which the ten most cited articles were analysed in depth. Findings indicate that dominant research emphasises auditory processing, rhythm sensitivity, and working memory as foundations supporting grammar acquisition and reading fluency. The SWOT analysis reveals strong theoretical grounding and methodological diversity alongside limitations related to indirect language measurements and limited classroom validation. Emerging opportunities include digital and hybrid learning models, while challenges involve curriculum constraints and equity issues. The study contributes a strategic roadmap for future research and pedagogical implementation. Aligning with Sustainable Development Goal 4, the findings highlight music's potential to support inclusive and effective language learning across diverse educational contexts.

**Keywords:** Music-based intervention; language development; children's literacy; auditory processing; early language learning

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## 1. Introduction

Music is one of the earliest ways youngsters experience the world around them. From peaceful lullabies and fun nursery rhymes to clapping games and sing-alongs, musical activities are woven into the fabric of early life. These moments are not simply for pleasure; they play a key role in how youngsters learn to listen, communicate, and eventually utilise language. In recent years, research has revealed the underlying cognitive and structural connections between music and language. Both rely on rhythm, pitch, and sound patterns that help the brain organise and interpret meaning, giving music a perfect basis for language development (Pino et al., 2023). These similar traits indicate that musical experiences can enhance the same skills children need to develop speech and literacy (Huang, 2023; Li & Liu, 2025).

Studies suggest that musical engagement promotes hearing accuracy, memory, and rhythm awareness. These are the key factors for comprehending and producing language (Wu et al., 2023). Children who regularly sing or engage in rhythmic play are likely to demonstrate higher grammar and reading fluency, as their sensitivity to patterns helps them learn language structure (Aini & Purnawati, 2025). Beyond its cognitive impact, music also helps emotional and social growth. It encourages youngsters, keeps them engaged, and creates a pleasurable learning environment where worry is replaced by curiosity and confidence (Lefterov & Mantovani, 2025).

In classrooms and families alike, singing, rhythm activities, and musical storytelling are proven to be powerful approaches to increase vocabulary, pronunciation, and expressive speech (Ngadni & Hui, 2025a; Selorm & Amoah, 2022). However, despite mounting evidence, music is still commonly ignored in education systems that prioritise test scores and measurable academic skills (Ngadni & Hui, 2025b). Teachers may lack the knowledge or resources to use music successfully, and in certain circumstances, it's rejected as mere entertainment rather than a genuine learning aid (Chen et al., 2022). Recognising music as a vital element of language development could revolutionise how children learn. When music becomes part of the educational foundation, it promotes not just linguistic ability but creativity, confidence, and connection with others.

Despite increasing scholarly attention to the relationship between music and children's language development, existing studies remain dispersed across cognitive science, education, and applied pedagogical contexts. Many investigations focus on isolated mechanisms or interventions without providing a strategic synthesis of influential research directions or implementation challenges. Consequently, a comprehensive evaluation integrating citation impact with strategic interpretation remains limited. Therefore, this study aims to synthesise influential research trends and evaluate the strategic strengths, limitations, opportunities, and threats shaping music-based language development research. The study addresses the following research questions:

1. What dominant scholarly trends characterise research on music and children's language development?

2. What strengths and limitations emerge from highly cited studies in this field?
3. What strategic opportunities and challenges inform future educational implementation?

## 2. Methodology

This study utilises a dual-analytical research strategy that combines bibliometric performance analysis with a qualitative SWOT analysis to systematically assess scholarly trends and strategic research directions in the field of music and children's language development. The bibliometric component focuses especially on document-level performance, utilising citation impact as the primary indicator of scholarly importance (Guo, 2022). A structured database search was undertaken utilising relevant terms linked to music, language development, and children's learning (Ma & Wang, 2025). From the recovered corpus, the top ten most cited journal articles were identified based on citation counts, publishing quality, and disciplinary relevance (Wu, 2022). Highly cited publications often function as conceptual anchors shaping theoretical development and research direction within a field. Focusing on influential studies enables deeper strategic evaluation while maintaining analytical clarity, a practice consistent with bibliometric review methodologies (Tao & Yu, 2025).

Following the identification of the top-cited articles, a qualitative content analysis was conducted to extract each study's main emphasis, methodological orientation, and major language-related findings (Kayadibi, 2022). These gathered data were then synthesised using a SWOT analytical framework, enabling systematic classification across four strategic dimensions: strengths, weaknesses, opportunities, and threats. Strengths and weaknesses were operationalised as internal scholarly characteristics, such as theoretical robustness, methodological rigour, and evidentiary limitations, while opportunities and threats were conceptualised as external and contextual factors, including pedagogical applicability, technological integration, policy relevance, scalability, and structural constraints within education systems (Xu et al., 2022).

The integration of bibliometric performance analysis with SWOT synthesis allows the study to transcend beyond descriptive citation mapping into strategic knowledge structuring (Utami, 2023). This combination methodology provides both evidence-based appraisal of prominent scholarship and forward-looking identification of research gaps, implementation issues, and innovation pathways (Wider et al., 2025). As such, the technique provides a consistent framework for combining high-impact research with strategic educational reform, policy planning, and future empirical inquiry in music-based language acquisition (Prihatini et al., 2025). Thus, the analytical results derived from this process are presented in the following section.

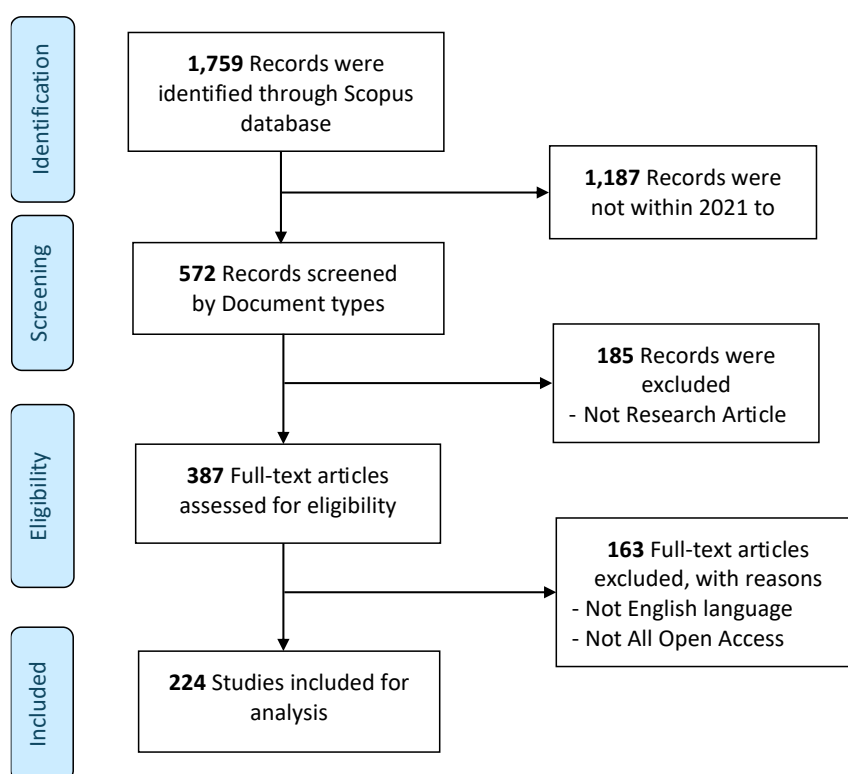
The bibliometric search strategy (Table 1) was driven by explicitly defined inclusion criteria to ensure the relevance, quality, and consistency of the retrieved literature. The Scopus database was selected for its broad coverage of high-impact, peer-reviewed articles across education, psychology, and interdisciplinary research. The search was narrowed to the 2021-2025 publication

period to capture recent and present scholarly trends. Searches were conducted in the TITLE-ABS-KEY fields using the keywords “music” AND “child\*” AND “language” to ensure thematic relevance. Only English-language journal articles published as open access were included, ensuring transparency, replicability, and unlimited access for analysis.

**Table 1: Inclusion criteria for bibliometric analysis**

Scopus database	ALL
Time period	2021 to 2025
Search field	TITLE-ABS-KEY
Search keywords	“music” AND “child*” AND “language”
Document Types	Article
Language	English
Open Access	All Open Access

The article selection procedure follows the PRISMA principles to ensure transparency and methodological rigour. Figure 1 shows that the initial 1,759 records were identified in the Scopus database. After applying the publication year filter, 1,187 records published outside the 2021-2025 timeframe were eliminated. The remaining 572 data were screened by document type, resulting in the deletion of 185 non-research publications. Subsequently, 387 full-text publications were reviewed for eligibility. Of these, 163 articles were rejected due to language constraints and open-access criteria. Finally, 224 eligible studies met all inclusion criteria and were included in the bibliometric analysis.



**Figure 1: PRISMA flowchart**

### 3. Results and Findings

#### 3.1 Performance Analysis by Documents

The bibliometric analysis identified 10 highly cited journal publications that collectively shape modern scholarship on music's role in promoting children's language development. As seen in Table 2, citation counts ranged from 11 to 106, showing varying degrees of scholarly influence. The most cited work by Hilton et al. (2022) dominates the subject, demonstrating substantial scholarly interest in the universal acoustic foundations shared by infant-directed speech and song. This paper presents a theoretical cornerstone linking musical and language input throughout early development.

**Table 2: Top ten most cited documents**

No.	Author(s)	Title	No. of Citations
1.	Hilton et al. (2022)	Acoustic regularities in infant-directed speech and song across cultures	106
2.	Nie et al. (2022)	Effects of Music Training on the Auditory Working Memory of Chinese-Speaking School-Aged Children: A Longitudinal Intervention Study	22
3.	Nitin et al. (2023)	Exploring individual differences in musical rhythm and grammar skills in school-aged children with typically developing language	20
4.	Tervaniemi et al. (2022)	Improved Auditory Function Caused by Music Versus Foreign Language Training at School Age: Is There a Difference?	20
5.	Shaw (2021)	Read, speak, sing: Promoting early literacy in the health care setting	18
6.	Kirby et al. (2023)	Music Uses in Preschool Classrooms in the U.S.: A Multiple-Methods Study	16
7.	Gustavson et al. (2021)	Musical Instrument Engagement in Adolescence Predicts Verbal Ability 4 Years Later: A Twin and Adoption Study	15
8.	Morini & Blair (2021)	Webcams, Songs, and Vocabulary Learning: A Comparison of In-Person and Remote Data Collection as a Way of Moving Forward with Child-Language Research	14
9.	Zanto et al. (2024)	Digital rhythm training improves reading fluency in children	12
10.	Chen et al. (2024)	Language learning through music on the academic achievement, creative thinking, and self-esteem of the English as a foreign language (EFL) learners	11

Several highly cited studies focus on auditory and cognitive principles that support language learning. Longitudinal and experimental evidence demonstrate that music training enhances auditory working memory, rhythm sensitivity, and neural auditory processing. The capacities are closely associated with grammar acquisition, reading fluency, and verbal ability (Nie et al., 2022; Nitin et al., 2023; Tervaniemi et al., 2022). The prevalence of these studies reflects a study emphasis on music as a facilitator of language-related cognitive functions rather than merely linguistic outcomes.

Other influential publications broaden the scope to educational and applied situations. Classroom-based and healthcare-oriented studies stress the relevance of singing and music activities in improving early literacy, vocabulary learning, and communicative engagement (Shaw, 2021; Kirby et al., 2023). Notably, post-pandemic research has boosted digital and remote music-based therapies, with evidence suggesting gains in vocabulary learning and reading fluency through online and rhythm-based training programmes (Morini & Blair, 2021; Zanto et al., 2024).

The overlay visualisation (Figure 2) shows a clear temporal progression in the research focus of studies on music and children's language development between 2021 and 2024. Earlier publications, predominantly clustered around 2021 (blue nodes), concentrate on foundational and theoretical perspectives, including early literacy promotion, parent-child interaction, and general associations between musical engagement and language abilities (Shaw, 2021; Gustavson, 2021).

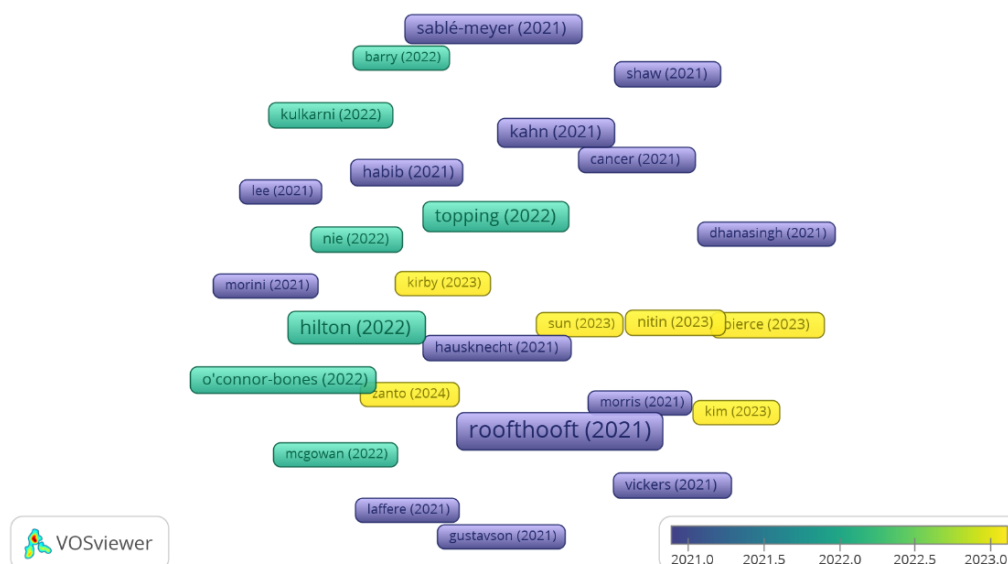


Figure 2: Overlay visualisation (VOSviewer)

### 3.2 SWOT Analysis

In this study, strengths and weaknesses reflect theoretical robustness, methodological quality, and evidentiary limitations within the reviewed literature, while opportunities and threats capture broader pedagogical, technological, and policy-related influences affecting implementation and

sustainability. By organising information across these four dimensions (Table 3), the SWOT framework provides a strategic assessment of current achievements, ongoing gaps, and future directions in music-based language development research.

**Table 3: SWOT analysis of music-based language development research**

No.	Author(s) & Year	Study Focus	Strengths	Weaknesses	Opportunities	Threats
1	Hilton et al. (2022)	Acoustic regularities in infant-directed speech and song across cultures	Large cross-cultural dataset; strong theoretical contribution; high methodological rigour	No direct measurement of children's language outcomes	Provides a foundational basis for music-based early language stimulation	The translational gap between acoustic theory and classroom practice
2	Nie et al. (2022)	Effects of music training on auditory working memory	Longitudinal design; clear cognitive mechanism; non-Western context	Language outcomes inferred indirectly	Supports structured music programmes to enhance language-related cognition	Limited scalability in schools with weak music infrastructure
3	Nitin et al. (2023)	Relationship between musical rhythm skills and grammar abilities	Highlights rhythm-grammar linkage; individual differences considered	No causal inference: grammar tested in controlled tasks	Enables rhythm-based, differentiated language interventions	Risk of overemphasising rhythm as the sole predictor
4	Tervaniemi et al. (2022)	Music vs. foreign language training on auditory function	Direct comparison; strong auditory neuroscience evidence	Language gains measured indirectly	Supports hybrid music-language instructional models	Misinterpretation that music can replace language instruction
5	Shaw (2021)	Singing, reading, and speaking for early literacy	Strong translational value; links health and education	No empirical intervention data	Expands music-language learning beyond schools	Dependence on parental engagement and literacy
6	Kirby et al. (2023)	Use of music in preschool classrooms	High ecological validity; classroom-based insights	Language outcomes are not directly measured	Identifies teacher training gaps in music pedagogy	Risk of music being treated as non-instructional
7	Gustavson et al. (2021)	Musical instrument engagement	Strong causal inference;	Focus on adolescence,	Justifies long-term investment in	Socioeconomic access to

No.	Author(s) & Year	Study Focus	Strengths	Weaknesses	Opportunities	Threats
		and later verbal ability	controls for genetic factors	not early childhood	music education	instruments may bias outcomes
8	Morini & Blair (2021)	Song-based vocabulary learning; in-person vs. remote	Methodological innovation: relevance to online learning	Short-term vocabulary focus	Supports scalable digital music-language interventions	Digital divide may widen inequities
9	Zanto et al. (2024)	Digital rhythm training and reading fluency	Direct language outcome; strong experimental design	Focus limited to fluency	Supports game-based and EdTech literacy tools	Overreliance on technology-based solutions
10	Chen et al. (2024)	Music-based language learning and holistic outcomes	Holistic outcomes; strong relevance to EFL contexts	Older learners; limited early childhood focus	Aligns music with SEL and whole-child development	Curriculum pressure may marginalise music-based learning

### 3.2.1 Strengths

#### 1. Strong Cognitive and Linguistic Foundations Linking Music and Language

A fundamental characteristic of literature is the substantial theoretical and empirical evidence indicating common cognitive pathways between music and language. Research repeatedly demonstrates overlaps in rhythm, prosody, and auditory sequencing that support grammatical development, reading fluency, and verbal ability (Hilton et al., 2022; Nitin et al., 2023; Zanto et al., 2024). Longitudinal, genetically informed research further supports causal explanations by showing that continuous musical engagement predicts subsequent verbal ability, even after controlling for genetic and environmental confounds (Gustavson et al., 2021). These converging findings position music as a structurally connected system with language, rather than an additional enrichment activity.

#### 2. Methodological Diversity and Scientific Rigour

Another strength lies in the methodological breadth of the reviewed studies, which include longitudinal interventions, cross-cultural acoustic analyses, neuroscientific comparisons, experimental designs, and behavioural genetics approaches (Hilton et al., 2022; Nie et al., 2022; Tervaniemi et al., 2022). This diversity allows triangulation of data across cognitive, neurological, and behavioural levels, strengthening the credibility of the music-language relationship. Experimental and digital intervention research also yields quantitative language-related outcomes, such as reading fluency and vocabulary learning (Morini & Blair, 2021; Zanto et al., 2024), thereby strengthening the empirical robustness of the discipline.

### 3.2.2 Weaknesses

#### 1. Indirect and Proxy Measures of Language Development

Despite substantial evidence, a recurring issue is the dependence on indirect indices of language progress. Much research emphasises auditory working memory, rhythm sensitivity, or neural auditory processing as proxies rather than testing expressive language, discourse skills, or communicative engagement directly (Nie et al., 2022; Tervaniemi et al., 2022). While these cognitive tests are theoretically relevant, they limit the generalisability of findings regarding functional language use in authentic educational contexts. As a result, the practical implications for classroom-based language training remain inferential rather than empirically established.

#### 2. Limited Ecological Validity and Contextual Transferability

Several studies are conducted under controlled experimental or laboratory conditions, which may not fully reflect real-world educational situations (Nitin et al., 2023; Zanto et al., 2024). Conversely, classroom-based investigations generally use descriptive or exploratory approaches, with limited rigorous outcome assessment (Kirby et al., 2023). This imbalance causes a gap between scientific precision and classroom applicability. Additionally, cultural and linguistic distinctiveness in some research, such as that conducted in EFL or non-Western contexts, may impede cross-context generalisability without careful modification (Nie et al., 2022; Chen et al., 2024).

### 3.2.3 Opportunities

#### 1. Digital and Hybrid Music-Language Learning Models

The research reveals significant opportunities to integrate music-based language learning into digital and hybrid educational paradigms. Evidence from remote song-based vocabulary acquisition and digital rhythm training suggests that music therapy can be delivered effectively through technology-enhanced platforms (Morini & Blair, 2021; Zanto et al., 2024). These approaches offer scalability, flexibility, and continuity of learning, particularly in post-pandemic and resource-constrained environments. Digital music-based therapies also connect with game-based and interactive learning paradigms, providing access to rhythm- and song-driven language development outside traditional classrooms.

#### 2. Early Intervention and Whole-Child Development Approaches

Music-based language learning offers significant opportunities for early intervention and overall child development. Research on infant-directed song and early literacy activities highlights music's importance in facilitating foundational language exposure, parent-child connection, and socio-emotional bonding (Hilton et al., 2022; Shaw, 2021). Studies in EFL environments further suggest that music increases not only academic language outcomes but also creativity and self-esteem (Chen et al., 2024). These findings support the placement of music within whole-child and SEL-oriented pedagogies, particularly in early childhood and primary school.

### 3.2.4 Threats

#### 1. Curriculum Constraints and Assessment-Driven Educational Systems

A key concern for the viability of music-based language systems is the prevalence of assessment-oriented curricula that emphasise examinable outputs above developmental processes. In many education systems, music is marginalised due to time restrictions, policy priorities, and insufficient alignment with standardised evaluations (Kirby et al., 2023; Chen et al., 2024). This institutional pressure decreases opportunities for systematic integration of music into language instruction, despite significant evidence of its advantages, and risks placing music as an optional or expendable component of the curriculum.

#### 2. Equity, Access, and Pedagogical Misinterpretation

Equity-related concerns also represent a danger to implementation. Access to musical instruments, trained educators, and digital infrastructure remains inconsistent, potentially perpetuating socioeconomic differences in language development possibilities (Gustavson et al., 2021; Morini & Blair, 2021). Furthermore, there is a possibility of educational misinterpretation, where music is perceived as enjoyment rather than as an organised, intentional instructional tool. Such shallow execution may weaken its linguistic impact and undermine long-term instructional value.

### 4. Discussion

The combined findings from bibliometric performance analysis and SWOT synthesis suggest a maturing yet strategically fragmented body of research on music in promoting children's language development. The preponderance of widely referenced foundational works, particularly those addressing acoustic regularities and common cognitive mechanisms between music and language, shows the field's strong theoretical footing (Hilton et al., 2022). These studies establish music as structurally associated with language through rhythm, prosody, and aural patterning, giving a firm conceptual basis for later empirical study. Longitudinal and experimental research further strengthen this alignment by indicating that music training contributes to auditory working memory, grammatical sensitivity, reading fluency, and subsequent verbal ability (Nie et al., 2022; Nitin et al., 2023; Zanto et al., 2024; Gustavson et al., 2021).

However, the SWOT analysis indicates continuing methodological and translational difficulties. While cognitive and neurological outcomes are extensively represented, direct measures of actual language usage remain comparatively underexplored (Tervaniemi et al., 2022). Classroom-based research, however rich in contextual relevance, often lacks rigorous outcome evaluation, thereby limiting its explanatory power for language development (Kirby et al., 2023). This discrepancy reflects a gap between high-impact theoretical research and scalable pedagogical implementation.

The findings further suggest that the effectiveness of music in supporting language development varies across contextual conditions. Music-based interventions appear strongest when implemented during early childhood, integrated systematically into instructional design, and sustained over extended

learning periods (Sun & Wong, 2025; James et al., 2024). Structured rhythmic training and teacher-guided musical interaction yield clearer linguistic outcomes than incidental exposure (Aini & Purnawati, 2025). Conversely, effects appear weaker when music is used primarily for entertainment, without explicit linguistic objectives, or when interventions are short-term and not aligned with pedagogical goals (Hoffmann et al., 2024). Resource limitations and unequal access to trained educators may also reduce effectiveness across educational contexts (Rodrigues et al., 2025). These boundary conditions highlight the importance of intentional instructional integration rather than passive musical exposure.

Notably, recent citation trends and SWOT potential suggest a rising emphasis on applied, digital, and holistic methods. Music-based therapies given through digital platforms and rhythm training demonstrate potential language-related effects and scalability (Morini & Blair, 2021; Zanto et al., 2024). At the same time, studies indicating socio-emotional and motivational advantages confirm music's importance within whole-child and SEL-oriented frameworks, particularly in EFL and early childhood environments (Shaw, 2021; Chen et al., 2024). Future research should therefore favour integrative, classroom-valid, and longitudinal approaches that bridge theoretical robustness with real teaching impact.

#### **4.1 Implications for Educational Practice and Pedagogy**

The findings contain substantial implications for classroom practice, particularly in early childhood, primary education, and EFL environments. Evidence from high-impact studies indicates that music-based activities, such as singing, rhythmic training, and systematic listening, can meaningfully support language development (Pino et al., 2023; Aini & Purnawati, 2025). Educators should therefore consider music not as an additional activity but as a pedagogically intended tool aligned with language-learning objectives (Mee et al., 2025).

The SWOT analysis further shows prospects for digital and hybrid music-language treatments, which offer scalability and flexibility, especially in resource-constrained contexts (Ma & Wang, 2025; Li & Liu, 2025). However, effective adoption requires teacher training that prioritises instructional design rather than entertainment-oriented usage of music. Pedagogical integration should be structured, outcome-driven, and developmentally appropriate, ensuring that musical aspects are explicitly linked to linguistic aims (Ngadni & Hui, 2025a).

#### **4.2 Implications for Research and Policy Development**

At the policy level, the findings show that music-based language acquisition demands stronger attention within curriculum frameworks and early intervention initiatives. Despite solid evidence of its linguistic and socio-emotional benefits, music is excluded from assessment-driven education systems (Ngadni & Hui, 2025b). Policymakers could consider embedding music-integrated language initiatives inside literacy programs, early childhood programmes, and inclusive education strategies. The bibliometric trend toward digital and applied interventions also aligns with national and global aspirations for technology-enhanced, equitable learning (Ma & Wang, 2025; Li & Liu, 2025).

However, equity problems remain salient. Unequal access to musical resources, competent educators, and digital infrastructure risk aggravating developmental gaps (Selorm & Amoah, 2022). Policy interventions should consequently focus on teacher capacity building, resource allocation, and community-based music-language projects (Pino et al., 2023). Future educational development should prioritise sustainability, scalability, and alignment with whole-child development goals, ensuring that music-based language learning contributes meaningfully to long-term educational outcomes (Aini & Purnawati, 2025).

## 5. Conclusion

This study provides a systematic and strategic synthesis of research on music's role in enhancing children's language development, merging bibliometric performance analysis with a SWOT analysis. By focusing on the top 10 most referenced journal publications, the findings emphasise the field's solid theoretical roots, particularly the shared cognitive and auditory mechanisms linking music and language. Highly influential research reveals that musical aspects such as rhythm, melody, and prosody boost crucial language-related outcomes, including auditory processing, grammatical sensitivity, reading fluency, and long-term verbal ability. These discoveries reinforce music's role as a meaningful, evidence-based contributor to children's language development rather than a peripheral enrichment activity.

At the same time, the SWOT analysis identifies key gaps that must be addressed to advance the field. While cognitive and neurological evidence is substantial, direct measurement of real language usage and classroom-based results remains restricted. Structural obstacles, curriculum pressures, and unequal access to musical resources further impede the sustainable implementation of music-based language systems. Encouragingly, recent trends toward digital, hybrid, and early-intervention models offer promising avenues for scalability and inclusive practice. This study is limited by its reliance on citation-based selection and secondary analysis of published research. While bibliometric methods identify influential scholarship, they may overlook emerging studies with lower citation counts.

Additionally, SWOT analysis involves interpretive synthesis, which may introduce subjective categorisation despite systematic procedures. Future studies may incorporate broader datasets and empirical validation to complement strategic review findings. Aligning with Sustainable Development Goal 4 (Quality Education), the findings call for inclusive, integrative, and innovative pedagogical approaches that enable equal access to effective language-learning opportunities for all children.

## 6. References

- Aini, Z., & Purnawati, A. S. (2025). The role of songs in supporting language development of pre-school children with language delays: a systematic review. *English Teaching Journal and Research: Journal of English Education, Literature, And Linguistics*, 5(1), 83-97. <https://doi.org/10.55148/etjar.v5i1.1659>
- Chen, M., Mohammadi, M., & Izadpanah, S. (2024). Language learning through music on the academic achievement, creative thinking, and self-esteem of the English as a foreign language (EFL) learner. *Acta Psychologica*, 247, 104318. <https://doi.org/10.1016/j.actpsy.2024.104318>
- Chen, T. C., Thiagarajan, P., & Yie, W. K. (2022). An analysis of the problems and challenges in teaching and learning creative dance as a pedagogical tool in Malaysian preschools. *International Journal of Academic Research in Business and Social Sciences*, 12(7), 1130-1148. <http://dx.doi.org/10.6007/IJARBS/v12-i7/14348>
- Guo, X. (2022). A bibliometric analysis of child language during 1900-2021. *Frontiers in Psychology*, 13, 862042. <https://doi.org/10.3389/fpsyg.2022.862042>
- Gustavson, D. E., Friedman, N. P., Stallings, M. C., Reynolds, C. A., Coon, H., Corley, R. P., ... & Gordon, R. L. (2021). Musical instrument engagement in adolescence predicts verbal ability 4 years later: A twin and adoption study. *Developmental Psychology*, 57(11), 1943. <https://psycnet.apa.org/doi/10.1037/dev0001245>
- Hilton, C. B., Moser, C. J., Bertolo, M., Lee-Rubin, H., Amir, D., Bainbridge, C. M., ... & Mehr, S. A. (2022). Acoustic regularities in infant-directed speech and song across cultures. *Nature Human Behaviour*, 6(11), 1545-1556. <https://doi.org/10.1038/s41562-022-01410-x>
- Hoffmann, S., Tschorn, M., & Spallek, J. (2024). Social inequalities in early childhood language development during the COVID-19 pandemic: a descriptive study with data from three consecutive school entry surveys in Germany. *International Journal for Equity in Health*, 23(1), 2. <https://doi.org/10.1186/s12939-023-02079-y>
- Huang, S. (2023). Music and language acquisition. In *SHS Web of Conferences* (Vol. 174, p. 02026). EDP Sciences. <https://doi.org/10.1051/shsconf/202317402026>
- James, C. E., Tingaud, M., Laera, G., Guedj, C., Zuber, S., Diambrini Palazzi, R., ... & Marie, D. (2024). Cognitive enrichment through art: a randomized controlled trial on the effect of music or visual arts group practice on cognitive and brain development of young children. *BMC complementary medicine and therapies*, 24(1), 141. <https://doi.org/10.1186/s12906-024-04433-1>
- Kayadibi, N. (2022). Bibliometric analysis of educational research on bilingualism. *International Journal of Education and Literacy Studies*, 10(3), 80-90. <https://doi.org/10.7575/aiac.ijels.v10n.3p.80>
- Kirby, A. L., Dahbi, M., Surrain, S., Rowe, M. L., & Luk, G. (2023). Music is used in preschool classrooms in the US: A multiple-methods study. *Early Childhood Education Journal*, 51(3), 515-529. <https://doi.org/10.1007/s10643-022-01309-2>
- Lefterov, P., & Mantovani, S. (2025). CLIL and Crescendo: An exploration of the contribution of music to language learning in early childhood. *Educazione Linguistica Language Education*, 14(1), 47-64. <https://doi.org/10.30687/elle/2280-6792/2025/01/003>
- Li, Z., & Liu, S. (2025). A review of the influence of music on foreign language teaching (1998-2024). *International Theory and Practice in Humanities and Social Sciences*, 2(9), 1-18. <https://doi.org/10.70693/itphss.v2i9.739>
- Ma, Y., & Wang, C. (2025). Empowering music education with technology: A bibliometric perspective. *Humanities and Social Sciences Communications*, 12(1), 1-14. <https://doi.org/10.1057/s41599-025-04616-2>
- Mee, R. W. M., Yob, F. S. C., Pek, L. S., Abd Rauf, M. F., Mingmei, Y., & Derahvasht, A. (2025). Building digital thinkers: A bibliometric analysis of computational

- thinking in children's education for a sustainable future. *Contemporary Educational Technology*, 17(3), ep581. <https://doi.org/10.30935/cedtech/16309>
- Morini, G., & Blair, M. (2021). Webcams, songs, and vocabulary learning: a comparison of in-person and remote data collection as a way of moving forward with child-language research. *Frontiers in Psychology*, 12, 702819. <https://doi.org/10.3389/fpsyg.2021.702819>
- Ngadni, I., & Hui, W. Z. (2025a). Exploring the challenges of implementing music in enhancing preschool children's English language acquisition. *International Journal of Academic Research in Progressive Education and Development*, 14(2), 185-194. <https://doi.org/10.6007/ijarped/v14-i2/25048>
- Ngadni, I., & Hui, W. Z. (2025b). Preschool educators' insights: exploring the role of music and movement in enhancing children's English language acquisition. *International Journal of Academic Research in Progressive Education and Development*, 14(2), 195-204. <https://doi.org/10.6007/ijarped/v14-i2/25046>
- Nie, P., Wang, C., Rong, G., Du, B., Lu, J., Li, S., ... & Tervaniemi, M. (2022). Effects of music training on the auditory working memory of Chinese-speaking school-aged children: a longitudinal intervention study. *Frontiers in psychology*, 12, 770425. <https://doi.org/10.3389/fpsyg.2021.770425>
- Nitin, R., Gustavson, D. E., Aaron, A. S., Boorum, O. A., Bush, C. T., Wiens, N., ... & Gordon, R. L. (2023). Exploring individual differences in musical rhythm and grammar skills in school-aged children with typically developing language. *Scientific Reports*, 13(1), 2201. <https://doi.org/10.1038/s41598-022-21902-0>
- Pino, M. C., Giancola, M., & D'Amico, S. (2023). The association between music and language in children: A state-of-the-art review. *Children*, 10(5), 801. <https://doi.org/10.3390/children10050801>
- Prihatini, A., Pangesti, F., & Zamahsari, G. K. (2025). Exploring trends and challenges on second language learning using bibliometric analysis. *Diksi*, 33(1), 99-124. <https://doi.org/10.21831/diksi.v33i1.75678>
- Rodrigues, H., Pereira, A. I., Rodrigues, P. M., Rodrigues, P. F., & Broock, A. (2025). Music and arts in early childhood education: paths for professional development towards social and human development. *Education Sciences*, 15(8), 991. <https://doi.org/10.3390/educsci15080991>
- Selorm, N. D., & Amoah, J. (2022). The use of music in language acquisition and meaning in children: a case study of selected schools in the Accra Metropolis. *International Journal of Humanities, Social Sciences and Education*, 9(7), 45-56. <https://doi.org/10.20431/2349-0381.0907005>
- Shaw, A. (2021). Read, speak, sing: Promoting early literacy in the health care setting. *Paediatrics & child health*, 26(3), 182-188. <https://doi.org/10.1093/pch/pxab005>
- Sun, M., & Wong, H. Y. (2025). A review of children's music education. *International Journal of Academic Research in Business and Social Sciences*, 15(1), 745-768. <http://dx.doi.org/10.6007/IJARBS/v15-i1/24422>
- Tao, Y., & Yu, C. (2025). Research trends of music in children with autism: a bibliometric analysis. *Frontiers in Psychiatry*, 16, 1553883. <https://doi.org/10.3389/fpsyg.2025.1553883>
- Tervaniemi, M., Putkinen, V., Nie, P., Wang, C., Du, B., Lu, J., ... & Tao, S. (2022). Improved auditory function caused by music versus foreign language training at school age: is there a difference? *Cerebral Cortex*, 32(1), 63-75. <https://doi.org/10.1093/cercor/bhab194>
- Utami, N. N. (2023). Bibliometric analysis of green economy learning for children (1996-2023): Current status and future directions. *QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama*, 15(1), 655-666. <https://doi.org/10.37680/qalamuna.v15i1.4127>

- Wider, W., Shareefa, M., Moosa, V., Ng, M. L., Isa, A. M. B. M., Fauzi, M. A., & Thant, Y. M. (2025). Mapping the terrain of social-emotional learning: A bibliometric study on its past, present, and future. *School Mental Health, 17*, 1097-1112. <https://doi.org/10.1007/s12310-025-09781-y>
- Wu, W. C., Yang, C. H., & Turner, M. (2023). Exploring the interdisciplinary relationship between music and language for enhanced bilingual curriculum. *Journal of Curriculum Studies Research, 5*(3), 96-112. <https://doi.org/10.46303/jcsr.2023.33>
- Wu, X. (2022). Motivation in second language acquisition: A bibliometric analysis between 2000 and 2021. *Frontiers in Psychology, 13*, 1032316. <https://doi.org/10.3389/fpsyg.2022.1032316>
- Xu, H., Cheng, X., Wang, T., Wu, S., & Xiong, Y. (2022). Mapping neuroscience in the field of education through bibliometric analysis. *Brain sciences, 12*(11), 1454. <https://doi.org/10.3390/brainsci12111454>
- Zanto, T. P., Giannakopoulou, A., Gallen, C. L., Ostrand, A. E., Younger, J. W., Anguera-Singla, R., ... & Gazzaley, A. (2024). Digital rhythm training improves reading fluency in children. *Developmental Science, 27*(3), e13473. <https://doi.org/10.1111/desc.13473>