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Global Research Trends in Music and Learning: A Bibliometric Analysis of Scopus Publications (1912-2025)

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ABSTRACT

Music education has gained growing attention in the global educational landscape of the digital era and is known to strengthen students' cognitive, social, and emotional skills, yet it is often treated as a supplementary subject with limited policy priority. This study aims to map the annual distribution of publications on music and learning and to identify the most productive authors and the most-cited works. Data were retrieved from Scopus on July 15, 2025, using the search string TITLE-ABS-KEY ("music" AND "learning"); of 16,327 records, 15,015 documents published between 1912 and 2025 were analyzed descriptively with Bibliometrix, and keyword co-occurrence was visualized with VOSviewer. Publications rose sharply after 2000, peaking at approximately 2,700 documents in 2022; the 2025 count is partial. Nine authors (Widmer, Yang, Serra, Calvo-Zaragoza, Ludovico, McPherson, Su, Altenmüller, and Fujinaga) each produced 10-25 documents across music psychology, music computation, and music learning technology, while the most-cited works are by Campbell and Hallam. Keyword analysis revealed four clusters: music education, digital learning, cognition, and computational music. The field is becoming more interdisciplinary and digitally oriented, although the broad search string means the findings cover music and learning rather than music education alone.

1. Introduction

The development of music education in learning has become an important focus in the global education field, especially in today's digital era (Smolarczyk et al., 2025). Music as an integral part of education has been proven capable of strengthening students' cognitive, social, and emotional skills (Blasco-Magraner et al., 2021; Del Barrio & Arús, 2024; (Váradi, 2022)). Despite this evidence, music education continues to be perceived as a supplementary field, resulting in limited policy priority at both school and national levels. This marginalization is further compounded by the lack of contextual curriculum integration that reflects local

culture and 21st-century competencies, even though research consistently demonstrates that culturally grounded and technology-assisted music learning can enhance students' motivation, creativity, and problem-solving skills (Aoonlamai & Kwangmuang, 2025); (Ng et al., 2022)). Classroom evidence from Indonesia points in the same direction, because combining audiovisual media with the Card Sort method improved elementary students' singing ability, participation, and confidence (Safia et al., 2026). The challenge of adapting digital technology in music learning has become particularly pressing in the post-COVID-19 era, when online learning shifted from an option to a necessity, demanding innovation in instructional design and the continuous development of teacher professionalism (Smolarczyk et al., 2025).

In response to these challenges, a growing body of research has sought to examine the impact and potential of music education across diverse learning contexts. Foundational studies, such as those by Patricia Shehan Campbell, emphasized the importance of understanding children's musical experiences from subjective, culturally responsive perspectives (Campbell, 2010). Building on this, Susan Hallam's empirical literature review demonstrated that music education yields comprehensive positive effects on students' cognitive and social development, reinforcing the case for an integrated music curriculum (Hallam, 2010). More recently, scholarship has increasingly turned toward the integration of digital technology as a catalyst for innovative learning, particularly through the use of artificial intelligence-based applications and online platforms that enable personalization and broader access to music education (Ma & Wang, 2025). Together, these strands of research reflect a field that is both expanding in scope and deepening in theoretical sophistication.

Nevertheless, significant gaps remain in the systematic understanding of this field's development. Existing bibliometric studies in music education have tended to focus on narrow subfields such as technology-enabled music learning (Ma & Wang, 2025) or music education in specific national contexts (Vicente Nicolás & Sánchez Marroquí, 2024), without providing a comprehensive, longitudinal mapping of the broader music and learning domain. Similarly, while (Lu & Song, 2025) offer a bibliometric review of music-based emotion regulation, that study addresses a different domain from music learning. Three gaps follow: (1) the absence of a long-term picture of how publications on music and learning have grown, (2) limited identification of the researchers who have consistently advanced the field, and (3) limited clarity on which works form its intellectual core. Bibliometric mapping has become a common way to fill such gaps in education, as shown by recent studies in this journal that used Scopus data with VOSviewer or Bibliometrix (Sihombing et al., 2026; (Yusuf et al., 2026). This study therefore aims to quantitatively analyze the development of research on music and learning based on bibliometric data retrieved from Scopus for the period 1912-2025. The research questions are: (1) How has the number of scientific publications on "music and learning" developed over time, as reflected in the annual distribution of documents? (2) Who are the most productive authors and researchers in this domain, and what are the defining characteristics of their contributions, including the works with the greatest citation impact?

2. Methodology

This research employs a quantitative-descriptive bibliometric approach to trace the development and research trends in the topic “Music and Learning” (Apriliansyah et al., 2026; Fadlullah et al., 2026). The bibliometric framework consists of four main stages: (1) determination of data sources, (2) search strategy, (3) analysis methods, and (4) preparation of research output. The entire data-based analysis process was conducted using the Scopus database (www.scopus.com) as the primary source of indexed scientific publications, covering publication years from 1912 to 2025. The selection of Scopus is justified by its broad coverage of reputable international journals and the completeness of metadata suitable for bibliometric analysis.

The search strategy employed the keyword formulation: TITLE-ABS-KEY (“music” AND “learning”) AND PUBYEAR > 1911 AND PUBYEAR < 2026, applied to the title, abstract, and keywords fields. This query retrieved a total of 16,327 documents, which were subsequently cleaned and filtered to include only peer-reviewed journal articles and conference proceedings. Data selection followed four sequential stages (Table 1 and Figure 1): (1) identification, in which the search returned 16,327 records; (2) restriction by document type, in which 1,021 records were excluded and 15,306 were retained; (3) removal of 246 duplicate records, identified by matching on DOI and title; and (4) metadata cleaning, which removed 45 records because records lacked publication year, source, or essential bibliographic metadata. The final dataset comprised 15,015 documents, and all subsequent analyses were based on this dataset. The search was conducted on July 15, 2025, and all results were downloaded in spreadsheet (CSV) and RIS formats for analysis. The extracted data includes author names, article titles, publication year, source/journal, abstract, keywords, document type, author affiliation, country, number of citations, and DOI. The dataset was cleaned to remove duplicates, and normalization was performed on author and institution names to ensure consistency. Figure 1 presents the bibliometric research methodology framework, which summarizes the four main phases from data collection to analysis and interpretation of results and reports the number of records at each selection stage.

Table 1. Data Selection and Filtering Process

Stage	Procedure / criteria	Excluded	Remaining
1. Identification	Scopus search TITLE-ABS-KEY (“music” AND “learning”) AND PUBYEAR > 1911 AND PUBYEAR < 2026, run on July 15, 2025	-	16,327
2. Document-type restriction	Retained: Article / Conference Paper, Book. Excluded: Book Chapter, Editorial, Note, Letter, Erratum, and other document types	1,021	15,306
3. Duplicate removal	Matching on DOI and title	246	15,060
4. Metadata cleaning	Records lacking publication year, source, or essential bibliographic metadata; normalization of author	45	15,015
Final dataset	Documents included in all analyses	-	15,015

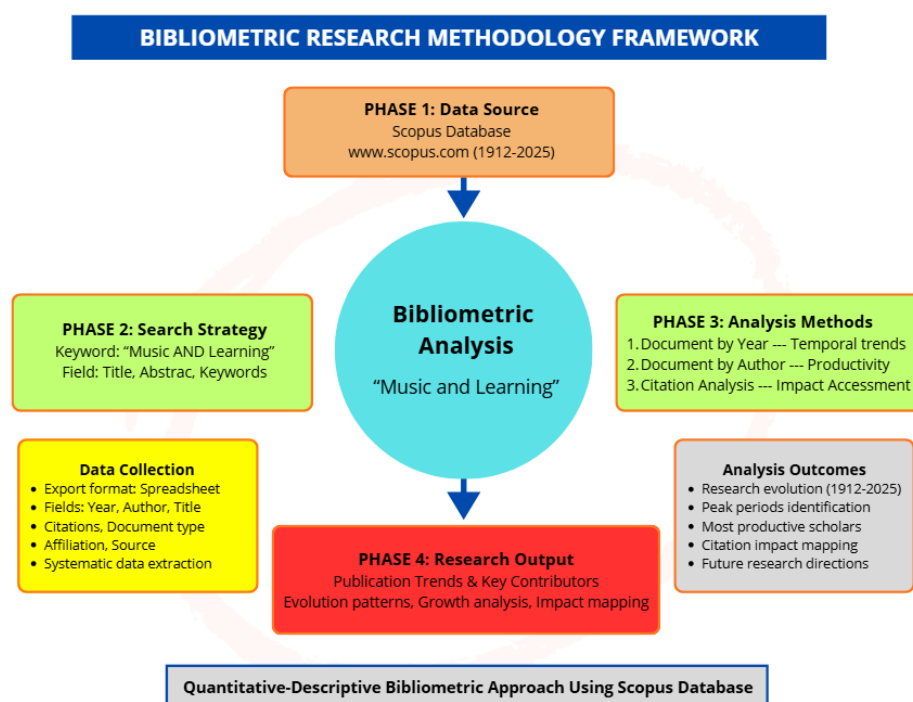


Figure 1. Bibliometric Research Methodology Framework

Bibliometric analysis was conducted using Bibliometrix (Aria & Cuccurullo, 2017); (Damayanti & Rahmawati, 2026) for descriptive statistical analysis, including annual publication trends, author productivity, and citation analysis, as well as VOSviewer for network visualization such as co-occurrence. The parameters used in each tool are summarized in Table 2. In Bibliometrix (version 4.3.2, R version 4.4.1), authors were identified through Scopus Author IDs; documents without an Author ID are not attributed to any individual author and are reported as "No Author ID found". Author productivity was counted using the full method, and authors with at least 10 documents are reported as the most productive. Citation counts are the total citations recorded in Scopus on July 15, 2025. The network visualization generated by VOSviewer is presented in Figure 2. VOSviewer (version 1.6.20) (Van Eck & Waltman, 2010) was used for keyword co-occurrence analysis, with all keywords as the unit of analysis and the full counting method. Keywords with at least 15 occurrences were included, which yielded 74 of 4,382 keywords. Synonyms and plural forms were merged using manual cleaning. Link strength was normalized using association strength, and clusters were formed using modularity-based clustering, resolution 1.00, minimum cluster size 5. No co-authorship or co-citation maps were built; the analysis focused on keyword co-occurrence. The map illustrates the co-occurrence relationships among keywords, grouped into clusters based on thematic similarity. The size of each node represents the frequency of keyword occurrence, while links between nodes indicate the strength of relationships among terms within the analyzed publications.

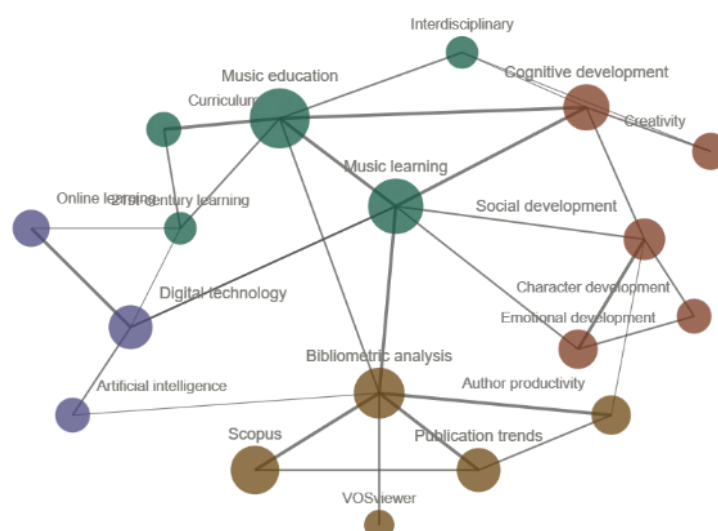


Figure 2. Keyword Co-occurrence Network Visualization using VOSviewer

Table 2. Analysis Parameters in Bibliometrix and VOSviewer

Tool	Analysis	Parameter	Setting
Bibliometrix (R)	All analyses	Software versions	R 4.4.1; Bibliometrix 4.3.2
Bibliometrix (R)	Annual production	Period and treatment of 2025	1912-2025; 2025 partially covered (data as of July 15, 2025)
Bibliometrix (R)	Author productivity	Author identification	Scopus Author ID; documents without an ID are reported as "No Author ID found"
Bibliometrix (R)	Author productivity	Counting method	Full
Bibliometrix (R)	Author productivity	Minimum documents for an author to be reported	≥ 10 documents
Bibliometrix (R)	Citation analysis	Citation source and date	Total citations recorded in Scopus on July 15, 2025
VOSviewer	All analyses	Software version	1.6.20
VOSviewer	Keyword co-occurrence	Unit of analysis	All keywords
VOSviewer	Keyword co-occurrence	Counting method	Full
VOSviewer	Keyword co-occurrence	Minimum occurrences of a keyword	74 of 4,382 keywords met the threshold
VOSviewer	Keyword co-occurrence	Keyword cleaning	Manual merging of synonyms and plurals
VOSviewer	Keyword co-occurrence	Normalization and layout	Association strength; VOSviewer default layout algorithm
VOSviewer	Keyword co-occurrence	Cluster formation	Modularity-based clustering; resolution 1.00; minimum cluster size 5

The analysis focused on three main aspects: (1) temporal trends in publications, (2) productivity of authors, and (3) mapping of citations and research themes. Through this approach, the research provides a comprehensive picture of the evolution of

“Music and Learning” studies, identifies the most influential contributors, and reveals the direction and opportunities for future research in this field.

3. Results and Discussion

The results follow the analytical sequence described in the Methodology. The final dataset of 15,015 documents (Table 1) was processed in four analyses (Table 2): (a) annual document counts for the publication trend; (b) author productivity based on Scopus Author IDs; (c) citation analysis of the most productive and most-cited authors; and (d) keyword co-occurrence mapping in VOSviewer. Each subsection first reports what the data show and then gives interpretations separately. The interpretations draw on earlier literature; the Scopus data describe patterns but do not test their causes.

Publication Trends and Exponential Growth of ‘Music and Learning’ Research

In recent decades, learning approaches that involve elements of art, particularly music, have received increasing attention in the education world. Music is now understood not only as entertainment, but also as a means that can support the learning process, enhance concentration, and strengthen students’ memory (Vigl et al., 2023); (Guo, 2025). Figure 3 presents the annual publication trend graph for the keywords “Music and Learning” from 1912 to 2025. The graph was produced from the annual document counts of the final dataset (15,015 documents); the count for 2025 is partial because data were retrieved on July 15, 2025.

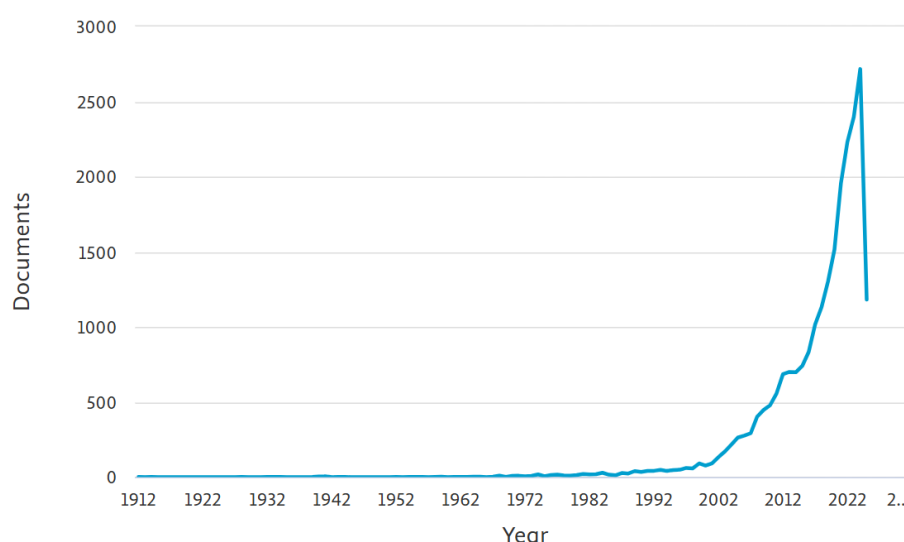


Figure 3. Scientific Publication Trend Graph (1912–2025)

Findings from the data. A sharp increase is visible since the early 2000s. Publication counts alone cannot show whether this reflects growing awareness of music’s role in learning. Based on graph analysis, the number of research publications on music in learning has experienced significant growth from 1912 to 2025, from almost no recorded documents in the early period to a large annual volume in recent years.

Six periods were distinguished to describe this growth. Period ranges are written from the start year to the year before the next period begins (for example, 1960-1980 denotes 1960-1979), so that no year is counted twice; the last period covers 2020-2025. The mean number of documents per year was calculated as the total number of documents in a period divided by the number of years in that period (Table 3); for 2020-2025 the divisor is 5.5 years because 2025 is incomplete. The period labels are descriptive names assigned by the authors according to the order of magnitude of these means; they are not breakpoints obtained from a statistical test.

Table 3. Publication Periods, Document Counts, and Mean Documents per Year

Period	Label	Years (n)	Documents	Mean documents per year
1912-1960	Foundation	48	7	0.15
1960-1980	Formalization	20	100	5.00
1980-2000	Stable growth	20	700	35.00
2000-2010	Expansion	10	1,500	150.00
2010-2020	Acceleration	10	6,000	600.00
2020-2025	Peak	5.5	6,708	1,219.64
Total		113.5	15,015	

Quantitatively, the growth trend follows an exponential pattern, especially after 2000 (identified visually from Figure 3; rapid growth). Decade-by-decade analysis reveals a clear evolution: the 1912-1960 foundation era showed nearly zero growth; the 1960-1980 formalization era averaged 5 documents per year; the 1980-2000 stable growth era averaged approximately 35 documents per year; the 2000-2010 expansion era averaged 150 documents per year; the 2010-2020 acceleration era reached approximately 600 documents per year; and the 2020-2025 peak era surged to an average of 1,219.64 documents per year. The steepest increase occurred after 2000, reaching a peak of approximately 2,700 documents in 2022, followed by a relatively sharp decline in the most recent years, part of which is due to the incomplete 2025 count.

Interpretation from the literature. The data show the pattern of growth but not its causes, so the explanations below are hypotheses proposed in earlier studies. The early period has been linked to a practice-oriented tradition of music education that was not yet systematically documented; American music education, for example, only began collecting systematic data in 1837 (Pemberton, 2021). The formalization period coincides with the establishment of the Society for Research in Music Education in 1960 and with the shift of the *Journal of Research in Music Education* from historical and descriptive toward experimental research (Warren, 1984). The rise after 2000 coincides in time with online learning platforms, AI-based music applications, and immersive technologies such as VR and AR in music education (Han et al., 2025), but this study did not test whether these developments increased publication output. The peak within 2020-2025 may partly reflect the rapid adoption of digital technology in music learning during the COVID-19 pandemic, and the later decline may reflect post-pandemic consolidation (Smolarczyk et al., 2025); the incomplete 2025 count is an additional, data-related reason for the decline. The literature also proposes three structural factors for the growth: the institutionalization of music education research through specialized

journals and professional organizations, the integration of digital technology, and growing global awareness of the value of music education for students' cognitive, emotional, and social development. Modern research reports that music education contributes not only to musical skills but also to language ability, mathematics, creativity, and social skills (García-García et al., 2024; T. Zaatar et al., 2024), and interdisciplinary work that combines psychology, neuroscience, information technology, and pedagogy is increasingly visible; this is consistent with the subdisciplines of the most productive authors (Section b) and with the keyword clusters in Figure 2.

Distribution of Author Productivity in 'Music and Learning'

Findings from the data. The author productivity graph shows a highly asymmetric distribution pattern, where more than 1,100 documents do not have a recorded author identity (No Author ID found), as presented in Figure 4. This condition may reflect limitations in metadata for older publications and the lack of formally registered affiliations. These documents (7.50% of the final dataset) cannot be attributed to any author, so all author-level results below describe only the 13,889 documents that carry at least one Scopus Author ID. Most of these records were concentrated in publications before 2000, with 842 documents (74.8%) published before 2000 and 284 (25.2%) published from 2000 onward.

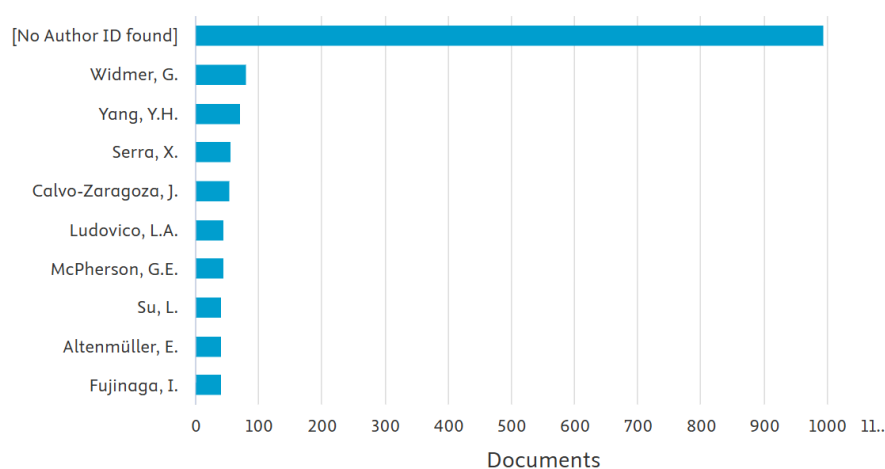


Figure 4. Author Productivity Distribution Graph

Meanwhile, identified authors such as Widmer, Yang, Serra, Calvo-Zaragoza, Ludovico, McPherson, Su, Altenmüller, and Fujinaga each contribute between 10 to 25 publications (9 authors reached the reporting threshold of at least 10 documents). This pattern is broadly in line with Lotka's Law, which states that a small proportion of authors produce the majority of publications, while the majority publish only one or two articles throughout their careers (Lotka, 1926 in Silva, 2017). No formal test of the fit to Lotka's Law was conducted, and because of the missing Author IDs the observed distribution should not be generalized to the whole field.

The productive authors work in diverse subdisciplines: music psychology (McPherson, Altenmüller), music computation (Widmer, Serra, Fujinaga), and music learning technology (Yang, Calvo-Zaragoza). Among authors with an Author ID, output is concentrated in a small group; whether these authors influence the direction of the field cannot be concluded from productivity counts alone. Comparisons with earlier studies and recommendations are given in the Discussion.

Leading Researchers and Most Cited Works in the ‘Music and Learning’ Field

Based on publication records from Scopus (accessed July 15, 2025), Table presents the most productive authors together with the two most-cited authors, Campbell and Hallam, and the titles of their most-cited works. Citation counts are the totals recorded in Scopus on that date (citation analysis, Table 2).

Table 4. Leading Researchers and Most Cited Works in Music and Learning

No	Author	Most Cited Paper Titles	Year	No. of Citations (estimated)
1	Patricia Shehan Campbell	<i>Songs in their Heads: Music and its Meaning in Children's Lives</i>	2010	1338
2	Clifford K. Madsen	<i>Competency-based music education</i> (co-author)	1973	700+
3	Susan Hallam	<i>The power of music: Its impact on the intellectual, social and personal development of children and young people</i>	2010	>1000
4	Graham Welch	<i>The Singer Takes it All: Sociological Perspectives on Music Education</i>	2006	>700
5	Colleen Conway	<i>Curriculum as Professional Action in Perspectives Music Teacher Education</i>	2008	500+
6	Gary E. McPherson	<i>Self-regulation and Music Learning</i>	2009	>600
7	David J. Hargreaves	<i>Developmental Psychology and Music Education</i>	1986	>700
8	Peter Webster	<i>Creative Thinking in Music: Advancing a Model</i>	2002	550+
9	William F. Thompson	<i>Music perception and cognition research in music education</i>	2005	400+

Among the most cited works in the field, two contributions stand out for their enduring scholarly influence. Patricia Shehan Campbell’s work explores children’s perceptions, experiences, and meanings of music through intensive observation of various groups of children in school and out-of-school environments. The main findings demonstrate that music is not merely an extracurricular activity, but a central part of children’s identity construction, emotion, and social communication. Campbell emphasizes the importance of understanding music from the perspective of children as active subjects, highlighting context-based, active, and culturally responsive music learning as keys to successful music education in the modern era. This work (Campbell, 2010) has been cited 1,126 times in Scopus (Table 4).

Susan Hallam’s empirical literature review discusses the broad effects of music learning on children’s and adolescents’ intellectual, social, and emotional development. Reviewing hundreds of empirical studies, Hallam found that music

education associated with improvements in memory capacity, attention, and academic achievement, particularly in mathematics and language. Beyond cognitive functions, music also serves as a vital tool in building self-confidence, social skills, and emotional resilience. Hallam emphasizes music education integration as a strategic investment in educational policy to foster adaptive and creative generations in the era of globalization. This work (Hallam, 2010) has been cited 2,418 times in Scopus (Table 4).

Keyword Co-occurrence Network

Findings from the data. Of the 4,382 keywords in the final dataset, 74 met the minimum-occurrence threshold of 15 and were included in the map (Figure 2). VOSviewer grouped them into 4 clusters: Cluster 1 (red, 24 keywords) contains music education, learning, teaching, students, children, classroom, curriculum, and pedagogy; Cluster 2 (green, 20 keywords) contains technology, digital learning, online learning, mobile learning, virtual reality, and educational technology; Cluster 3 (blue, 17 keywords) contains cognition, psychology, memory, attention, creativity, and emotion; Cluster 4 (yellow, 13 keywords) contains computational music, machine learning, artificial intelligence, music information retrieval, and algorithmic learning. The most frequent keywords are music (2,946 occurrences), learning (2,301 occurrences), education (1,486 occurrences). Interpretation. Clusters are groupings of keywords that occur together in the same documents, and the cluster labels were assigned by the authors on the basis of the most frequent keywords and their semantic similarity within each cluster. Because the corpus combines several subdisciplines (see Discussion, Section d), some clusters may reflect differences in vocabulary between subdisciplines rather than distinct research themes within music education.

Discussion

Each subsection first restates the main finding from the data, then compares it with earlier studies, and finally offers an interpretation and its implications.

Interpretation of Publication Growth Trends

Main finding. The data show growth in the number of documents from the early 2000s to a peak of approximately 2,700 documents per year, followed by a decline in the most recent years (Figure 3, Table 3); the count for 2025 is incomplete. Comparison with previous research. The exponential growth in music and learning publications identified in this study is consistent with broader patterns observed in adjacent bibliometric studies. Ma & Wang, (2025), in their bibliometric analysis of technology-enabled music education using the Web of Science database, similarly documented rapid annual publication growth exceeding 12% since the early 2000s which suggests that the surge is not specific to Scopus, although the two studies differ in scope and search strategy. A comparable sequence of exponential growth followed by thematic consolidation has been described for Spanish music education literature (Vicente Nicolás & Sánchez Marroquí, 2024).

Interpretation and implications. The data describe when publications increased but not why. The COVID-19 pandemic accelerated the adoption of digital tools in music education (Ng et al., 2022; Smolarczyk et al., 2025), so the peak in 2020–2025 may partly reflect this acceleration, and the decline that follows may reflect a consolidation phase rather than a genuine waning of interest. However, because 2025 was incomplete at the time of data retrieval, part of the decline is a data artifact. The same caution applies to AI-based applications, VR, and AR (Han et al., 2025): their emergence coincides with the growth in publications, but a causal link cannot be inferred from publication counts. Neuroscientific evidence linking musical training to neuroplasticity and cognitive enhancement (T. Zaatar et al., 2024) may have lent the field cross-disciplinary legitimacy and attracted researchers from psychology, neuroscience, and educational technology; this is also a proposed explanation rather than a finding. The three structural drivers discussed in the Results (institutionalization, digital integration, and rising global awareness) therefore remain hypotheses. Testing them would require designs that go beyond annual counts, such as comparing keyword trends before and after 2020 or examining the founding dates of journals and societies. Until complete data for 2025 and later years are available, the post-peak trajectory should be treated as provisional.

Author Productivity and Knowledge Concentration

Main finding. More than 1,100 documents (7.50% of the dataset) have no Author ID. Among the authors who do, nine contributed 10–25 documents each across music psychology, music computation, and music learning technology (Figure 4, Table 4). Comparison with previous research. Uneven author productivity, with a few authors accounting for a large share of output, has also been reported in bibliometric studies of technology-enabled music education (Ma & Wang, 2025) and of Spanish music education research (Vicente Nicolás & Sánchez Marroquí, 2024), and it is broadly in line with Lotka’s Law (Lotka, 1926 in Silva, 2017)).

Interpretation and implications. The highly asymmetric author productivity distribution observed in this study warrants careful interpretation beyond the simple application of Lotka’s Law. The large number of unidentified authors (over 1,100 documents with no recorded author ID) represents a methodological challenge specific to longitudinal bibliometric studies spanning more than a century of publication data. Earlier publications, particularly those predating the systematic digitization of academic records, are systematically underrepresented in author attribution metadata. This means the apparent dominance of a small cohort of highly productive authors may partly be an artifact of incomplete metadata for older documents rather than a true reflection of productivity concentration in contemporary scholarship. For this reason, the concentration reported here describes only authors with a Scopus Author ID and should not be read as evidence of dominance across the whole field. Documents without an Author ID cannot be assigned to anyone, so the output of individual authors may be underestimated and the true distribution may be more or less concentrated than shown. The year distribution indicates that 842 of the 1,126 records without an Author ID (74.8%) were published before 2000, while 284 (25.2%) were published from 2000 onward.

Statements about “core authors” should therefore not be generalized beyond this dataset, and a sensitivity check using author names instead of Author IDs is recommended for future work.

The concentration of productive authorship across distinct subdisciplines music psychology (McPherson, Altenmüller), music computation (Widmer, Serra, Fujinaga), and music learning technology (Yang, Calvo-Zaragoza), reflect the fragmented disciplinary identity of the music and learning field. Unlike fields with a single unified theoretical paradigm, music and learning research is constituted by multiple partially overlapping communities that share objects of inquiry but differ in methodological traditions and theoretical frameworks. This fragmentation is both a strength and a limitation: it enables cross-disciplinary fertilization, but also means that core findings from one subdiscipline are often slow to be integrated into adjacent communities. Because co-authorship was not analyzed, this study cannot say how much collaboration occurs within or across these subdisciplines. Co-authorship network analysis, together with attention to international collaboration and support for early-career researchers, is a direction for future research.

Dominant Research Themes and Future Directions

Main finding. The most-cited works in the corpus are (Campbell, 2010) and (Hallam, 2010), which concern children’s musical experience and the developmental effects of music education and the keyword map (Figure 2) shows four dominant clusters covering music education and learning, digital and technology-assisted learning, cognition and psychology, and computational music and AI. The sustained citation impact of foundational works by Campbell (2010) and Hallam (2010) suggests that the most-cited literature in this corpus remains anchored to holistic, developmental perspectives on music education. Despite the rapid influx of technology-oriented research in the 2010-2025 period, the most-cited works continue to foreground the role of music in children’s identity formation, socio-emotional development, and cognitive growth rather than in instrumental performance outcomes or curriculum efficiency metrics.

Comparison with previous research. This pattern diverges from what has been documented in the technology-in-education literature more broadly, where technologically mediated interventions have increasingly displaced humanistic framings in citation networks (Ma & Wang, 2025). Interpretation and implications. The interdisciplinary orientation emerging in the contemporary era carries important implications for educational policy. Research combining neuroscience, psychology, and pedagogy (Guo, 2025; T. Zaatar et al., 2024; Vigl et al., 2023) is producing a more granular evidence base for music education’s cognitive and affective benefits than was available even a decade ago. The present data do not measure policy uptake. The two most-cited works are an observational study of children’s musical lives and a literature review, and longitudinal intervention studies demonstrating sustained policy-level impact were not among the most-cited works identified here. This observation is limited to those works; a systematic analysis of study designs across the corpus is needed before concluding that such studies are scarce.

The integration of digital technology including AI-based adaptive learning platforms, Virtual Reality, and Augmented Reality environments (Han et al., 2025), is a prominent emerging research direction in the literature and keyword trends in this dataset. Constructivist frameworks for technology-integrated music education, such as the ubiquitous learning model validated by Aoonlamai & Kwangmuang, (2025), demonstrate that technology can serve not only as a delivery mechanism but as a genuine scaffold for creativity and student agency. This shifts the theoretical framing from technology-as-tool to technology-as-pedagogy, a transition with implications for teacher training, curriculum design, and assessment frameworks in music education worldwide. Future research should therefore prioritize designs that bridge individual-level outcomes documented in laboratory settings with school- and system-level implementation data.

Corpus Heterogeneity and Its Implications for Interpretation

The search string TITLE-ABS-KEY (“music” AND “learning”) retrieves any document in which both words appear. The corpus therefore combines music education, music cognition, music therapy, and computational music learning, and it may also include documents in which “learning” refers to machine learning applied to music rather than to education. This heterogeneity affects the interpretation of the results in three ways.

First, for trends: the growth in Figure 3 describes the broad “music and learning” corpus, not music education alone. Growth in computational and AI-related work on music could raise document counts without any increase in educational research, so the exponential pattern should not be read as growth in music education specifically. Second, for authors: several of the most productive authors work in music computation (Widmer, Serra, Fujinaga), and their prominence may reflect research on computational music learning rather than educational research; the author ranking should therefore not be read as leadership in music education. Third, for clusters and themes: keyword clusters may separate along subdisciplinary lines, so a dominant theme reflects the composition of the search results as much as the priorities of any single field. Cluster 1 primarily represents music education and pedagogy; Cluster 2 represents educational technology and digital music learning; Cluster 3 represents music psychology, cognition, and developmental research; and Cluster 4 represents music computation, machine learning, and AI-related research.

These limitations lead to more specific recommendations for future studies. Researchers could (1) restrict the search with Scopus subject-area filters or add education-specific terms such as “music education” or “music teaching”; (2) exclude computational documents (for example, by adding NOT “machine learning”) or split the corpus into subcorpora by subdiscipline; (3) repeat the trend, author, and keyword analyses separately for each subcorpus; and (4) use more than one database. Comparing results across subcorpora would show which findings hold for music education itself and which depend on the breadth of the search string.

Limitations of the Study

Several limitations of this study must be acknowledged. First, the exclusive reliance on the Scopus database introduces a systematic coverage bias. While Scopus is the largest abstract and citation database of peer-reviewed literature, its coverage of non-English publications, book chapters, and grey literature is limited. Given that music education research has strong traditions in non-Anglophone contexts particularly in continental Europe, Latin America, and East Asia the present findings may underrepresent scholarly contributions from these regions and overestimate the dominance of English-language research paradigms. Second, the broad keyword formulation TITLE-ABS-KEY (“music” AND “learning”) retrieves a heterogeneous corpus encompassing music education, music cognition, music therapy, and computational music learning, among other subdisciplines. This breadth enables panoramic trend analysis but limits the specificity of thematic conclusions. Future studies would benefit from applying more granular keyword strategies or using database-defined subject categories to delineate subdisciplinary boundaries more precisely.

4. Conclusion

This study set out to trace the development of research on music and learning and to identify its most productive authors and most-cited works. Regarding the first research question, publications in the Scopus dataset grew from almost none in the early twentieth century to a large annual volume in recent years, with the steepest rise after 2000, followed by a decline at the end of the period. Part of this decline is a data artifact, because the most recent year was only partially covered at the time of retrieval. The data describe the pattern of growth; the reasons proposed in earlier literature, such as digital technology, the COVID-19 pandemic, and growing awareness, were not tested here.

Regarding the second research question, the most productive authors (Widmer, Yang, Serra, Calvo-Zaragoza, Ludovico, McPherson, Su, Altenmüller, and Fujinaga) work in music psychology, music computation, and music learning technology. This indicates a field with several research communities rather than a single core group. The most-cited works, by Campbell and Hallam, address children's musical identity and the intellectual, social, and personal effects of music education. Because many documents lack an Author ID, these findings describe identifiable authors and do not show which researchers dominate the field.

Overall, the study succeeded in answering both research questions and in providing a long-term map of the field. This success is bounded, however: Scopus coverage is partial, the broad search string produced a heterogeneous corpus, and publication and citation counts reflect scholarly output and attention, not the effectiveness of teaching or policy. Future research should use more refined keywords, multiple databases, separate subcorpora, and complete data for recent years.

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