

Global Research Trends in Hand Codes (Sign Language) and Moral Values Education for Students with Hearing Impairment: A Bibliometric Analysis (2019–2024)

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Abstract: *This study examines global research trends in hand codes (sign language) and moral values education for students with hearing impairment through a bibliometric analysis of Scopus-indexed journal articles published between 2019 and 2024. Although moral values education is central to inclusive education, students with hearing impairment continue to face barriers in accessing value-based learning due to communication constraints. To address the fragmented nature of existing scholarship, this study maps international collaboration patterns, dominant research themes, and author-level research communities shaping this interdisciplinary field. A total of 1,068 English-language journal articles in the Social Sciences and Psychology subject areas were analysed using VOSviewer. The analysis focuses on country-level co-authorship networks, keyword co-occurrence patterns, and author-level co-authorship structures as indicators of scholarly collaboration, thematic emphasis, and knowledge development. The findings reveal a research landscape dominated by high-income countries, particularly the United States, the United Kingdom, Canada, and Australia, which exhibit strong international collaboration and high scholarly visibility. Thematic analysis indicates that the literature is primarily concentrated on sign language-mediated communication, inclusive education, ethics, moral values, decision-making, and quality of life for individuals with hearing impairment. Author-level analysis further highlights distinct collaborative research communities integrating linguistic, educational, and ethical perspectives. Despite increasing research activity, the literature remains geographically uneven, with limited representation from low- and middle-income regions. This study provides a focused overview of global research trends and identifies critical gaps to inform future research, policy development, and ethically grounded educational practices for students with hearing impairment.*

Keywords: bibliometric analysis, sign language, moral values education, hearing impairment, inclusive education

1. Introduction

Moral values education is widely recognized as a fundamental component of holistic human development, encompassing ethical reasoning, character formation, and social responsibility (Nucci et al., 2024). Within educational contexts, moral education plays a crucial role in fostering empathy, respect, and prosocial behaviour among learners, particularly in

increasingly diverse and inclusive learning environments (Chianese & Bombardelli, 2024; UNESCO, 2020). For students with disabilities, moral values education extends beyond academic achievement, serving as a vital mechanism for promoting social inclusion, identity development, and overall well-being (UNESCO, 2020). More broadly, research on special educational needs across varied schooling contexts reinforces the need for inclusive approaches that support learners' social and moral development (Nic Aindriú et al., 2020).

2. Literature Review

Students with hearing impairment encounter distinct challenges in accessing moral and values-based education due to communication barriers, limited instructional resources, and pedagogical approaches that are often insufficiently adapted to their linguistic and cognitive needs (Marschark & Hauser, 2012). Communication is central to moral learning, as moral concepts are commonly transmitted through dialogue, storytelling, and social interaction. In this regard, hand codes, sign language, and other forms of manual communication have emerged as essential pedagogical tools for facilitating meaningful learning experiences among deaf and hard-of-hearing learners (Cannon et al., 2022; Kusters et al., 2017).

Beyond their role in conveying academic content, hand codes and sign-based communication systems function as powerful mediators of moral reasoning and values education. Through visual-gestural modalities, abstract moral concepts such as fairness, responsibility, and respect can be more effectively contextualised, communicated, and internalised by students with hearing impairment (Mayer & Leigh, 2010). Consequently, scholarly attention has increasingly focused on the intersection of communication strategies, moral education, and deaf education across disciplines including education, psychology, special education, and the social sciences.

Despite the growing volume of research in this area, existing studies remain fragmented and dispersed across journals and research domains, with considerable variation in theoretical perspectives, methodological approaches, and educational contexts. To date, there is limited systematic evidence that maps the intellectual structure, publication trends, influential contributors, and emerging themes related to hand codes and moral values education for students with hearing impairment. This absence of a comprehensive overview constrains the identification of research gaps and limits the advancement of evidence-based pedagogical practices. Bibliometric analysis offers a robust and objective approach to addressing this limitation by quantitatively examining large bodies of scholarly literature to reveal publication patterns, collaboration networks, citation structures, and thematic evolution within a research field (Donthu et al., 2021).

Specifically, the study focuses on collaborative structures and thematic patterns as indicators of scholarly influence and knowledge development within the field. By systematically mapping the research landscape, this study seeks to generate insights for researchers, educators, and policymakers, and to inform future directions in inclusive moral education for deaf and hard-of-hearing learners. To achieve these objectives, the study is guided by the following research questions.

- i. What are the patterns of international research collaboration and global citation influence in studies on hand codes and moral values education for students with hearing impairment?

- ii. What are the main thematic clusters and research foci in the literature on hand codes and moral values education for students with hearing impairment, as revealed through keyword co-occurrence analysis?
- iii. What do author-level co-authorship patterns reveal about key contributors and collaborative research communities shaping knowledge development in research on hand codes and moral values education for students with hearing impairment?

3. Methodology

This study adopts a bibliometric analysis approach to systematically examine research trends, influential contributors, collaboration patterns, and thematic developments in the field of hand codes and moral values education for students with hearing impairment. Bibliometric analysis is a well-established quantitative method for exploring the intellectual structure and evolution of a research domain through the analysis of published scholarly literature (Donthu et al., 2021; Öztürk et al., 2024). To ensure methodological rigor and reliability, the study followed a systematic procedure encompassing data collection, screening, refinement, and analysis.

The Scopus database was selected as the primary data source due to its comprehensive coverage of high-quality, peer-reviewed journals across multiple disciplines, including education, social sciences, psychology, and special education. Compared with other databases such as Web of Science and PubMed, Scopus provides broader multidisciplinary indexing, robust citation tracking capabilities, and advanced tools for bibliometric analysis, making it particularly suitable for mapping global research trends and scholarly influence in this field (Baas et al., 2020).

3.1 Research Strategy

This study adopted a systematic and transparent search strategy to identify relevant scholarly publications for bibliometric analysis. The search process was conducted using the Scopus database, which was selected due to its comprehensive coverage of peer-reviewed journals within the social sciences and psychology, as well as its robust citation indexing capabilities. The initial search was performed using the following search string: TITLE-ABS-KEY (((("sign language" OR communication) AND ("moral education" OR ethic OR value) AND (disability OR disabilities OR deaf))))**, which yielded a total of 3,891 documents. This broad search was designed to capture the full scope of research addressing sign language and communication within moral, ethical, and value-based educational contexts involving individuals with disabilities, particularly those who are deaf.

To enhance the relevance and analytical focus of the dataset, a series of refinement criteria were subsequently applied as shown in Table 2. First, the subject areas were limited to Social Sciences and Psychology, as these disciplines are most closely aligned with moral education, ethical development, communication practices, and psychosocial perspectives. Second, the document type was restricted to journal articles to ensure methodological consistency and scholarly rigor. Finally, only publications written in English were included to facilitate accurate interpretation and systematic analysis.

Resulted in 1,068 articles, Table 1 shows search string used in scopus which constituted the final dataset for bibliometric analysis, the final search string was as follows:

*TITLE-ABS-KEY (((("sign language" OR communication) AND ("moral education" OR ethic OR value) AND (disability OR disabilities OR deaf))) AND (LIMIT-TO (SUBJAREA, "PSYC") OR LIMIT-TO (SUBJAREA, "SOC")) AND (LIMIT-TO (DOCTYPE, "ar"))) AND (LIMIT-TO (LANGUAGE, "English"))***,

This structured search and screening process ensured that the selected publications were current, peer-reviewed, and directly aligned with the objectives of the study. All eligible articles indexed in the Scopus database at the time of data extraction were included, thereby providing a robust and representative corpus for examining research trends, influential contributors, and thematic developments within the field.

Table 1: Search String Used in Scopus

Scopus	TITLE-ABS-KEY (((("sign language" OR communication) AND ("moral education" OR ethic* OR value*) AND (disability OR disabilities OR deaf))) AND (LIMIT-TO (SUBJAREA, "PSYC") OR LIMIT-TO (SUBJAREA, "SOC")) AND (LIMIT-TO (DOCTYPE, "ar"))) AND (LIMIT-TO (LANGUAGE, "English"))
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Table 2: Selection Criteria

Criterion	Inclusion	Exclusion
Language	English	Non-English
Subject Area	Social Sciences, Psychology	Other subject areas
Literature Type	Journal (article)	Conference, Book, Review

Overall, this rigorous search and screening process ensures a focused, reliable, and representative dataset for bibliometric analysis of research trends, influential scholarship, and thematic structures in sign language-based moral and values education for individuals with hearing impairment.

3.2 Data Analysis

The bibliometric data retrieved from the Scopus database were analysed using VOSviewer (version 1.6.20), a widely recognised software for constructing and visualising bibliometric networks. VOSviewer was selected for its capacity to handle large-scale bibliographic datasets and to generate visually intuitive representations that facilitate the systematic interpretation of collaboration patterns, thematic structures, and intellectual relationships within educational research (van Eck & Waltman, 2017).

Aligned with the aims of this study, multiple complementary bibliometric techniques were employed to examine how research on sign language and communication has evolved in relation to moral values education, ethics, and disability, particularly within deaf and hard-of-hearing contexts. Collectively, these techniques enabled a comprehensive exploration of international collaboration, thematic emphasis, and scholarly connectivity. The analysis specifically focused on co-authorship patterns at both country and author levels to examine collaborative structures at global and individual scales, with scholarly influence inferred through publication connectivity and network centrality alongside keyword co-occurrence analysis to uncover dominant research themes and conceptual linkages shaping the field.

Co-Authorship by Country Analysis

The co-authorship by country analysis was conducted to explore how scholarly collaboration in this field is distributed across different national contexts. By examining cross-country co-

authorship patterns, this analysis highlights the extent to which research on sign language, communication, and moral values education is shaped by international partnerships. The visualised network reveals both dominant and peripheral contributors, offering insight into the geographic concentration of knowledge production and the role of leading countries in facilitating global research collaboration. This analysis is particularly relevant for understanding how educational research on disability and inclusion is influenced by regional research capacity and international cooperation.

Keyword Co-Occurrence Analysis

Keyword co-occurrence analysis was employed to identify the thematic structure and conceptual focus of the literature. By examining the frequency with which keywords appear together across publications, this method reveals clusters of interconnected concepts that reflect shared scholarly interests. The visualisation demonstrates strong thematic linkages between sign language, communication, disability, ethics, education, and quality of life, suggesting that the field is predominantly grounded in human-centred and values-based perspectives. This thematic mapping offers a structured understanding of how educational, ethical, and communicative dimensions converge in research addressing the learning experiences and social inclusion of deaf and hard-of-hearing learners.

Co-Authorship by Author Analysis

The co-authorship by author analysis was undertaken to explore collaborative relationships among individual scholars contributing to the field. This analysis identifies key authors, research groups, and collaborative networks that underpin knowledge development in sign language and moral values education. The visualised author network reveals clusters of scholars working on closely related themes and highlights influential contributors who serve as connectors across research communities. These collaboration patterns reflect the interdisciplinary nature of the field and underscore the importance of shared scholarly expertise in advancing inclusive, ethically informed educational practices for learners with hearing impairment.

4. Results and Discussions

This section presents and discusses the findings of the bibliometric analysis with a specific focus on international research collaboration and global citation influence in studies addressing hand codes (sign language), communication, and moral values education for students with hearing impairment. Using data retrieved from the Scopus database and analysed through VOSviewer, the results provide insight into how scholarly collaboration and citation patterns shape the development, visibility, and global influence of this interdisciplinary research field. The discussion situates these findings within the broader literature on disability, education, ethics, and communication studies (Donthu et al., 2021; van Eck & Waltman, 2017).

4.1 Research Question 1: What are the patterns of international research collaboration and global citation influence in studies on hand codes and moral values education for students with hearing impairment?

To address the first research question, Figure 1 illustrates the country-level co-authorship network derived from Scopus-indexed publications focusing on sign language, communication practices, moral and ethical education, and hearing impairment. Although the dataset includes scholarly contributions from a wide range of countries, only a limited number met the minimum

publication threshold, indicating a concentrated and uneven pattern of international research collaboration.

The network visualisation clearly identifies the United States as the most central and influential node within the global collaboration structure. Its dominant position reflects strong institutional capacity, sustained research funding, and a long-standing tradition of scholarship in deaf education, communication sciences, and applied ethics. In addition to high publication output, studies originating from the United States also demonstrate strong citation influence, suggesting that research produced in this context plays a key role in shaping theoretical frameworks and methodological approaches in the field. This pattern is consistent with broader bibliometric evidence highlighting the leading role of the United States in disability and educational research (Donthu et al., 2021; Hallinger & Kovačević, 2019).

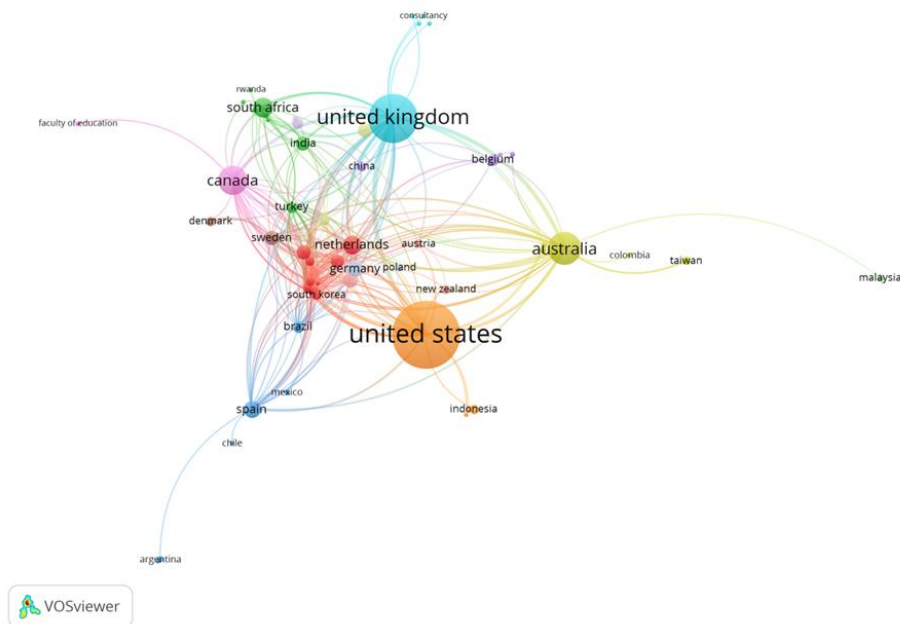


Figure 1: Network visualisation of country-level co-authorship displays international research collaborations among countries meeting the minimum publication threshold

Alongside the United States, the United Kingdom, Australia, and Canada emerge as prominent contributors with substantial co-authorship ties. These countries form a closely connected cluster characterised by frequent international collaboration and high citation visibility. The strength of these linkages suggests shared research agendas centred on inclusive education, ethical dimensions of communication, and value-based pedagogical approaches for students with hearing impairment. The prominence of these English-speaking countries further underscores the role of linguistic accessibility and shared policy frameworks in facilitating international collaboration and amplifying global citation impact (Waltman, 2016).

Several European countries, including the Netherlands, Germany, and Spain, are also present within the network, albeit with comparatively fewer and weaker linkages to dominant hubs. While these countries demonstrate sustained engagement in sign language and disability-related research, their relative citation influence appears more modest. This may reflect differences in publication strategies, national research priorities, and language-mediated access to high-impact international journals.

In contrast, contributions from low and middle income regions remain peripheral within the global collaboration network. Countries such as Malaysia, Indonesia, and South Africa appear at the margins of the visualisation, indicating emerging but still limited participation in international research partnerships. The peripheral positioning of these countries suggests not only lower publication output but also weaker integration into influential citation networks. Consequently, locally grounded scholarship on moral values education and communication practices for deaf learners may receive comparatively limited global recognition, despite its contextual significance.

In the Malaysian context specifically, this peripheral positioning warrants closer examination. Beyond general structural disparities in research funding and infrastructure, several context specific challenges may constrain the international publication trajectory of Malaysian scholars working in moral values education within special education. First, moral and values education research in Malaysia is frequently embedded within culturally specific ethical traditions, national curriculum frameworks, and socio-religious orientations. While these dimensions are intellectually rich and pedagogically meaningful, they may not always align seamlessly with dominant Western theoretical paradigms that often shape editorial expectations in high-impact international journals. As a result, locally grounded studies may be perceived as context-bound rather than theoretically generalisable, limiting their acceptance in global publishing venues.

Second, many Malaysian researchers in special education operate within practitioner based environments particularly school settings where heavy teaching responsibilities and limited institutional research support constrain sustained scholarly output. Restricted access to international collaboration networks, limited large-scale grant funding for cross-national projects, and uneven academic writing support in English further compound these challenges. Third, the intersectional niche of moral values education and deaf education may experience a dual marginality: moral education research tends to be underemphasised within mainstream disability studies, while disability perspectives remain peripheral within broader moral and character education scholarship. This structural positioning reduces thematic visibility within high-impact disciplinary journals.

Taken together, these structural, linguistic, and epistemic factors may contribute to lower publication output, reduced citation visibility, and weaker integration into global co-authorship networks for Malaysian scholars. The peripheral representation observed in the bibliometric network, therefore, should not be interpreted solely as an indicator of limited scholarly activity, but also as a reflection of broader asymmetries in global academic recognition and knowledge circulation.

Overall, the findings reveal a research landscape that remains Western-centric and citation-concentrated, with intellectual influence strongly associated with countries possessing established academic infrastructures and robust international publishing access. While international collaboration is evident, it remains unevenly distributed, and citation impact closely mirrors centrality within the collaboration network.

Addressing these disparities requires more than increased output; it necessitates structural and epistemic shifts in global research collaboration. Strengthening equitable cross regional partnerships, expanding access to international funding mechanisms, supporting scholarly writing development, and promoting open access dissemination models may enhance the visibility of research from underrepresented contexts. Equally important is greater epistemic

One major thematic cluster centres on language and communication development, with frequently co-occurring keywords such as “sign language,” “hand codes,” “language disability,” “language development disorders,” “bilingualism,” and “complex communication needs.” This cluster highlights sustained scholarly attention to the role of sign language as both a linguistic system and a pedagogical tool for supporting cognitive, social, and moral development among deaf learners. The integration of language-related terms with educational and ethical concepts suggests that communication is not treated merely as a technical skill, but as a foundational medium through which moral values, social norms, and identity are constructed and transmitted.

A second cluster relates to education, assessment, and learning contexts, encompassing keywords such as “education of hearing disabled,” “inclusive education,” “school child,” “assessment,” “psychometrics,” and “questionnaire.” This cluster reflects research efforts to evaluate educational practices, learning outcomes, and assessment tools used with students with hearing impairment. The frequent co-occurrence of assessment-related terms indicates an emphasis on measuring not only academic achievement, but also communicative competence, social participation, and value-based learning outcomes. Within this cluster, moral values education appears implicitly embedded in broader discussions of inclusive and equitable educational provision (UNESCO, 2020).

A third thematic cluster is oriented toward ethics, values, and decision-making, as indicated by keywords such as “ethics,” “medical ethics,” “decision making,” “social values,” “confidentiality,” and “social justice.” The presence of these terms suggests growing scholarly concern with the ethical dimensions of education, healthcare, and communication practices involving individuals with hearing impairment. This cluster reflects an increasing recognition that moral values education extends beyond classroom instruction to include ethical decision-making in educational placement, healthcare communication, and support services. The intersection of ethics-related keywords with disability and communication highlights the need for value-sensitive and rights-based approaches when working with deaf learners (Beauchamp & Childress, 2019).

Another notable cluster focuses on wellbeing, quality of life, and social participation, represented by keywords such as “quality of life,” “wellbeing,” “social care,” “patient care,” and “inclusion.” This cluster indicates that research increasingly frames sign language and moral values education within broader concerns about holistic wellbeing and social inclusion. The emphasis on quality of life suggests a shift toward outcome-oriented perspectives that prioritise dignity, autonomy, and meaningful participation in society for individuals with hearing impairment.

Emerging keywords such as “inclusive education,” “social justice,” “empathy,” and “voice” further signal a gradual epistemological shift toward more participatory, rights-based, and value-driven research paradigms. These terms align with contemporary movements advocating for the recognition of deaf individuals as active agents in educational decision-making and moral discourse, rather than passive recipients of intervention. This trend mirrors broader developments in disability scholarship that challenge deficit-based models and emphasise empowerment, representation, and ethical accountability (Kusters et al., 2017).

Despite the richness of these thematic clusters, the co-occurrence analysis also reveals several gaps in the literature. Research addressing cultural and contextual variations in moral values

education for deaf students remains limited, particularly in low- and middle-income regions. Keywords associated with Southeast Asia and other underrepresented contexts appear only marginally in the network, suggesting that dominant research narratives are still shaped largely by Western educational and ethical frameworks. In addition, intersectional factors—such as gender, socioeconomic background, and multiple disabilities—are not strongly represented, indicating areas where future research could deepen understanding of diverse learner experiences.

Overall, the keyword co-occurrence analysis demonstrates that research on hand codes and moral values education for students with hearing impairment is characterised by interconnected thematic clusters spanning communication, education, ethics, and wellbeing. The field appears to be gradually evolving toward a more holistic and value-oriented perspective, integrating linguistic, educational, and ethical dimensions. Moving forward, advancing this research agenda will require stronger interdisciplinary collaboration, greater inclusion of diverse cultural contexts, and sustained attention to moral values as a core component of communication and education for deaf learners.

4.3 Research Question 3: What do author-level co-authorship patterns reveal about key contributors and collaborative research communities shaping knowledge development in research on hand codes and moral values education for students with hearing impairment?

To address Research Question 3, an author-level co-authorship analysis was conducted to examine collaborative relationships among scholars contributing to research on hand codes (sign language), communication, and moral values education for students with hearing impairment. Co-authorship analysis provides insight into how knowledge development within a field is shaped through sustained scholarly collaboration, allowing the identification of key contributors, research communities, and patterns of collective knowledge production (Glänzel & Schubert, 2004; Donthu et al., 2021). As shown in Figure 3, the author-level co-authorship network reveals distinct collaboration clusters and central authors, indicating the role of sustained scholarly partnerships in shaping knowledge development within the field.

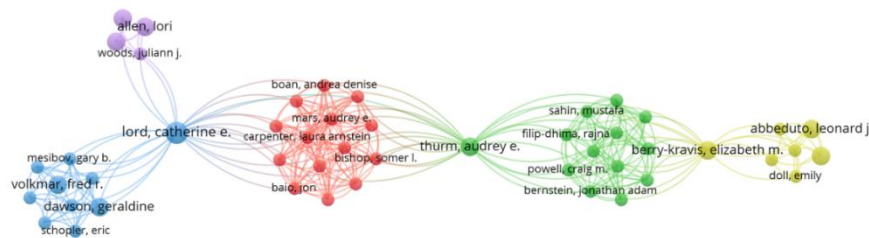


Figure 3: Author-level co-authorship network visualising collaborative patterns among authors in research on hand codes and moral values education for students with hearing impairment.

The author-level co-authorship network reveals a clear concentration of collaboration among a relatively small number of scholars who occupy central positions within the network. These authors demonstrate repeated co-authored relationships across multiple publications, indicating their influential role in shaping research agendas and advancing scholarly discourse in the field. Their centrality suggests that knowledge development in research on moral values education for students with hearing impairment is driven less by isolated individual efforts and more by interconnected research teams that integrate expertise from education, communication studies, and disability research.

Notably, authors specialising in sign language linguistics and deaf education form tightly connected collaboration clusters. These research communities emphasise the role of sign language not only as a mode of communication, but also as a pedagogical and cultural medium through which moral concepts, values, and social norms are transmitted. The strength of collaboration within these clusters reflects the field's reliance on linguistically grounded approaches to support moral reasoning, identity formation, and social participation among deaf and hard-of-hearing learners (Kusters et al., 2017; Cannon et al., 2022). Such collaborative patterns highlight the foundational contribution of sign language scholarship to values-based educational research.

In parallel, additional co-authorship clusters emerge around scholars whose work intersects moral education, ethics, disability studies, and inclusive education. These collaborative groups focus on issues such as ethical decision-making, social inclusion, learner autonomy, and rights-based educational practices within disability contexts. The presence of collaborative ties between these clusters suggests an increasingly interdisciplinary research environment, where ethical perspectives are integrated into educational research through sustained partnerships rather than isolated disciplinary contributions (Beauchamp & Childress, 2019).

The co-authorship analysis further indicates that authors who act as connectors across multiple collaboration clusters play a critical role in facilitating intellectual exchange and knowledge integration within the field. By collaborating with researchers from different thematic backgrounds, these authors contribute to the consolidation of shared conceptual frameworks and the diffusion of ideas across subfields. This pattern is consistent with broader bibliometric evidence highlighting the importance of collaborative networks in enhancing scholarly visibility, productivity, and intellectual influence (Glänzel & Schubert, 2004; Donthu et al., 2021).

Despite the strengths of these collaborative structures, the author-level co-authorship network also reveals certain limitations. Research collaboration appears to be concentrated within specific geographic and institutional contexts, with a predominance of authors affiliated with Western academic settings. This concentration suggests that knowledge development in the field may reflect regionally specific perspectives, potentially limiting the inclusion of culturally diverse approaches to moral values education mediated through sign language. Expanding cross-regional and cross-cultural collaboration among authors would therefore be essential for enriching theoretical perspectives and strengthening the global relevance of the field (Waltman, 2016).

Overall, the author-level co-authorship analysis demonstrates that research on hand codes and moral values education for students with hearing impairment is shaped by collaborative research communities rather than individual scholarly contributions. Key authors function as

collaborative anchors who connect linguistic, educational, and ethical perspectives through sustained co-authorship. Strengthening inclusive and internationally diverse collaboration networks will be crucial for advancing a more comprehensive, culturally responsive, and ethically informed knowledge base in this area of educational research.

5. Limitations and Future Work

Despite providing a systematic and integrative overview of global research on hand codes (sign language), communication, and moral values education for students with hearing impairment, this bibliometric study is subject to several limitations that warrant consideration.

First, the analysis was limited to English-language journal articles indexed in the Scopus database. Although Scopus offers extensive coverage of high-quality scholarly publications, this restriction may have excluded relevant studies published in other bibliographic databases or in non-English languages. This limitation is particularly significant in the field of deaf education and moral values research, where locally grounded and context-specific studies—often published in regional or national journals—play an important role in shaping culturally responsive educational practices (Donthu et al., 2021; Waltman, 2016).

Second, the interpretation of collaboration networks and thematic clusters derived from co-authorship and keyword co-occurrence analyses inevitably involved a degree of analytical judgement. While the analyses were conducted using established bibliometric procedures and supported by systematic examination of network structures and keyword contexts, some level of subjectivity in cluster interpretation cannot be entirely avoided. This issue is especially pertinent in interdisciplinary fields such as sign language education and moral values education, where concepts related to ethics, communication, and inclusion may carry different meanings across disciplinary boundaries (van Eck & Waltman, 2017).

Third, the temporal scope of the dataset was confined to publications indexed up to early 2024. As research on inclusive education, moral values pedagogy, and rights-based approaches in disability studies continues to evolve rapidly, more recent publications and emerging research directions may not yet be fully reflected in the findings.

Future research can address these limitations in several ways. Expanding data sources to include additional bibliographic databases, such as Web of Science, ERIC, and regional indexing platforms, would provide a more comprehensive representation of global scholarship. Greater inclusion of non-English literature would also enhance the cultural and contextual diversity of future bibliometric analyses, particularly by incorporating perspectives from underrepresented low- and middle-income regions.

Methodologically, future studies could strengthen analytical robustness through multi-researcher validation of network interpretations and thematic classifications. In addition, region- or country-specific bibliometric analyses may offer deeper insights into local research priorities, policy influences, and culturally embedded approaches to moral values education mediated through sign language. Finally, longitudinal analyses focusing on the evolution of collaboration patterns and thematic emphasis over time would be valuable for tracing shifts in research agendas, pedagogical orientations, and international research partnerships. Such efforts would contribute to the development of more inclusive, culturally responsive, and ethically grounded educational practices for students with hearing impairment worldwide.

6. Conclusion

This bibliometric study provides a systematic and integrative overview of global research on hand codes (sign language), communication, and moral values education for students with hearing impairment published between 2019 and 2024. By examining international collaboration patterns, thematic concentrations, and author-level research communities, the study maps the structural development and evolving priorities of this interdisciplinary field and offers a clearer understanding of how knowledge is produced and shared within it (Donthu et al., 2021).

The findings indicate that scholarly influence remains largely concentrated in high-income countries, particularly the United States, the United Kingdom, Canada, and Australia. These countries dominate publication output and international collaboration networks, reflecting structural advantages associated with established research infrastructures and greater access to funding. Although contributions from emerging regions are gradually increasing, the continued predominance of Western perspectives limits the cultural and contextual generalisability of existing scholarship, highlighting the need for broader geographic and epistemic representation in future research (Waltman, 2016).

Importantly, the peripheral positioning of countries such as Malaysia within the collaboration network should be interpreted within this broader structural context. The relative marginality observed in the bibliometric visualisation does not necessarily indicate a lack of scholarly engagement, but rather reflects systemic challenges related to research funding, international collaboration access, linguistic publication barriers, and epistemic alignment with dominant theoretical paradigms. In fields such as moral values education where scholarship is often culturally embedded and shaped by national curriculum frameworks locally grounded research may struggle to gain recognition within globally dominant academic discourses. Addressing this imbalance requires both capacity strengthening at the national level and greater epistemic inclusivity within international publishing systems.

From a thematic standpoint, the literature reflects a strong convergence around sign language-mediated communication, inclusive education, ethics, social justice, and quality of life. This convergence signals a paradigmatic shift toward rights-based, value-oriented, and human-centred approaches in deaf education. The increasing prominence of themes such as participation, autonomy, and social inclusion suggests that deaf learners are increasingly conceptualised as moral agents rather than passive recipients of educational intervention (UNESCO, 2020; Kusters et al., 2017).

The author-level collaboration patterns further reinforce the interdisciplinary character of the field. Knowledge development is shaped by sustained collaborative networks integrating expertise in linguistics, education, disability studies, and ethics. Such collaborative structures enhance intellectual coherence and scholarly visibility but also highlight the need for more geographically diverse research partnerships to enrich theoretical and contextual perspectives.

Overall, this study contributes to the field by making visible the structural dynamics underlying global research production in moral values education for students with hearing impairment. Advancing the field will require deliberate efforts to expand equitable international collaboration, support culturally grounded research, and strengthen the global visibility of scholarship emerging from underrepresented regions. For Malaysia and comparable contexts,

strategic investment in cross-national partnerships, publication mentoring, and thematic positioning within global debates on inclusive and moral education may enhance research impact while preserving contextual authenticity.

Ultimately, developing a more inclusive and epistemically diverse research ecosystem is essential for ensuring that moral values education for learners with hearing impairment is informed not only by dominant academic centres, but also by culturally responsive, locally meaningful, and ethically grounded knowledge from across the global South. Such a shift is fundamental to advancing equitable, linguistically accessible, and socially just educational practices worldwide.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this study.

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