INDIGENOUS EDUCATION AND IPED RESOURCES: A BIBLIOMETRIC ANALYSIS OF EDUCATION RESEARCH 2005–2025

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Abstract— **This study presents a bibliometric analysis of research on Indigenous resources in education published from 2005 to 2025. Indigenous resources are understood as culturally grounded educational assets, including Indigenous knowledge systems, language, land-based practices, and community partnerships that support meaningful, inclusive, and equitable learning experiences. Using Harzing's Publish or Perish and VOSviewer, a total of 55 peer-reviewed articles were analyzed following a PRISMA-guided screening process. The analysis focused on keyword co-occurrence, publication trends, and highly cited scholarly works. The findings reveal that research in this field is organized around five interconnected themes: community-based knowledge and practice, institutional education and student achievement, Indigenous rights and land, holistic well-being, and identity and engagement. Publication trends indicate a shift from earlier emphases on access, achievement, and institutional structures toward more recent attention to culturally responsive educational resources, land-based learning, Indigenous identity, and rights-based approaches. Citation patterns further show that the most influential studies foreground decolonizing and Indigenous research paradigms, positioning educational resources as relational, ethical, and community-centered rather than purely technical. Despite increasing scholarly attention, gaps remain in the integration of emerging themes such as climate change education, land stewardship, and legal frameworks for Indigenous consent. The study underscores the need for future research to advance community-led, interdisciplinary, and Indigenous-centered educational frameworks that position Indigenous knowledge as foundational in education systems.**

Keywords— ***Indigenous education, bibliometric analysis, Indigenous resources, community-based learning***

I. INTRODUCTION

Indigenous resources in education refer to the knowledge, cultural practices, languages, and ways of knowing or theories of knowledge of Indigenous peoples that are integrated into formal learning environments. This integration is important because it fosters cultural relevance, identity affirmation, and educational equity for Indigenous students, while also enriching curricula with diverse worldviews that challenge dominant Western paradigms (Druker-Ibáñez & Cáceres-Jensen, 2022; Shive, 2025; Zidny et al., 2020). However, significant issues persist, including the marginalization of Indigenous knowledge as subordinate or secondary, institutional barriers, lack of teacher preparedness, and tokenistic inclusion rather than genuine epistemic integration (Da Silva et al., 2023; Druker-Ibáñez & Cáceres-Jensen, 2022; Shive, 2025; Yip & Chakma, 2024). Indigenous education has gained increasing attention as educators and policymakers seek to move beyond narrow measures of achievement toward approaches that honor Indigenous knowledge, identity, and community well-being. Quality Indigenous education is often described as holistic and relational, emphasizing balance across the physical, emotional, intellectual, and spiritual dimensions of learners and positioning schooling as interconnected with family, community, and land. Within this broader vision, "resources" are not limited to textbooks or funding, but also include cultural knowledge, language, land-based practices, and community partnerships that collectively support the success of Indigenous learners.

Research gaps persist in developing coherent frameworks that position Indigenous knowledge as foundational rather than supplementary, as well as in understanding practical pedagogical approaches and community partnerships that support sustainable integration (Dwi et al., 2025; Seleke et al., 2025; Yip & Chakma, 2024). Many studies highlight the fragmented nature of current efforts, often limited to isolated case studies or superficial curriculum adaptations, underscoring the need for systemic reform and culturally nourishing schooling models that involve Indigenous families and knowledge keepers (Dwi et al., 2025; Lowe et al., 2020; Shive, 2025). Conducting a bibliometric analysis, as opposed to a traditional literature review, enables the mapping of the research landscape, the identification of thematic clusters, trends, and gaps, and provides a comprehensive overview of how Indigenous resources are being integrated globally across disciplines and educational levels (Dwi et al., 2025). Despite this expanded understanding, much of the empirical literature on Indigenous education remains fragmented across various topics, including school improvement, curriculum reform, language revitalization, and climate-related land education.

To address these gaps, the present study conducts a bibliometric analysis of publications on Indigenous resources in education from 2005 to 2025. Specifically, it aims to: (1) analyze co-occurrence links between key terms such as school, resource, community, identity, land, and climate change; (2) identify the temporal evolution of these terms to trace shifts from access and achievement-oriented research toward sovereignty and land-based perspectives; and (3) determine the most influential articles that anchor these thematic clusters. By systematically mapping this literature, the study seeks to move beyond conventional narrative reviews and provide an evidence-based overview of how Indigenous resources in education are conceptualized, where research efforts have been concentrated, and which emerging directions—such as land-based climate

education and decolonizing resource use—warrant further scholarly attention. Such an analysis can guide future research priorities and policy development by revealing underexplored areas and fostering interdisciplinary dialogue, ultimately supporting more inclusive, culturally responsive, and equitable education systems that honor Indigenous epistemologies (Druker-Ibáñez & Cáceres-Jensen, 2022; Dwi et al., 2025; Zidny et al., 2020).

II. METHODS

Bibliometric analysis was employed to systematically map and evaluate the research landscape on indigenous resources in education. This method is scientifically justified as it enables the identification of research trends, thematic clusters, and knowledge gaps by quantitatively analyzing publication patterns, citation networks, and keyword co-occurrences. A bibliometric tool, specifically VOSviewer, was employed to visualize the relationships among key concepts and authors, revealing a fragmented yet evolving discourse on the integration of indigenous knowledge in educational contexts (Dwi et al., 2025). The process began with a comprehensive literature search using Harzing's Publish or Perish software, which extracted 200 records from Google Scholar and other academic databases. The initial dataset included journal articles and conference proceedings. To ensure scientific rigor and relevance, books (n = 50) were excluded, as bibliometric analysis prioritizes peer-reviewed articles for their standardized metadata and citation metrics (Molise, 2025; Ogegbo & Ramnarain, 2024). Further screening for topical relevance and alignment with research objectives resulted in the removal of 95 documents, leaving a final sample of 55 articles for in-depth analysis.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart was utilized to transparently document the literature selection process. PRISMA is a widely recognized framework that enhances methodological transparency and reproducibility in systematic reviews by detailing each stage of identification, screening, eligibility, and inclusion (Naidoo et al., 2023; Ogegbo & Ramnarain, 2024; Webb & Mashford-Pringle, 2022). In this study, PRISMA guided the removal of duplicates, non-peer-reviewed sources, and irrelevant studies, ensuring a robust and unbiased sample. VOSviewer was then applied to the curated dataset to generate visual maps of co-authorship, keyword co-occurrence networks. This facilitated the identification of dominant research themes emerging in areas such as indigenous resources in education, culturally responsive pedagogy, and the integration of indigenous knowledge in STEM and teacher education (Dwi et al., 2025; Matindike & Ramdhany, 2024; Ogegbo & Ramnarain, 2024). The combination of bibliometric analysis, PRISMA, and VOSviewer provided a comprehensive, replicable, and visually interpretable overview of the field, supporting evidence-based recommendations for future research and policy development.

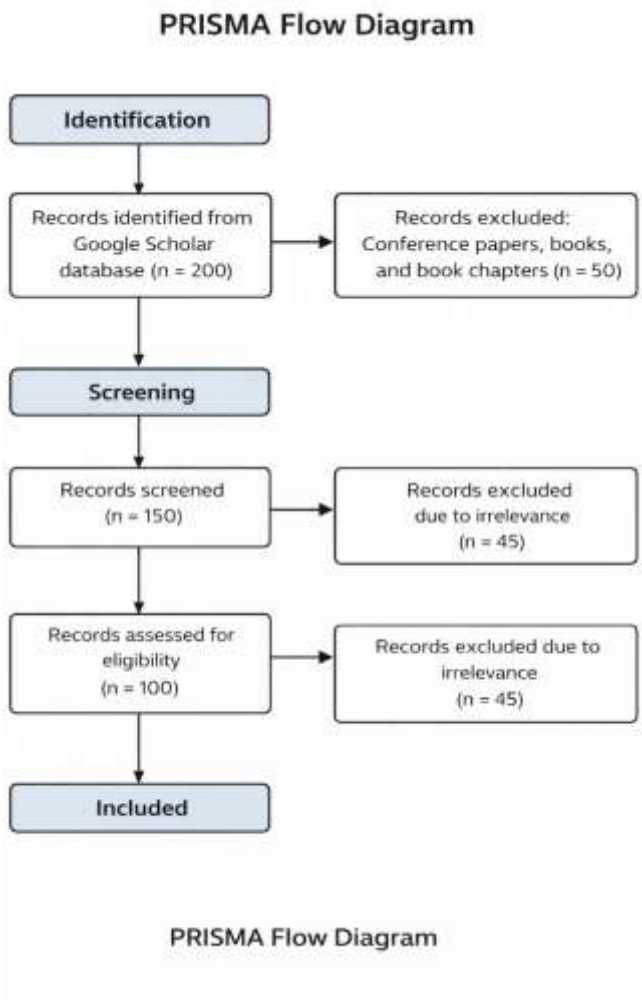

Figure 1. PRISMA Flowchart

The screening and selection of literature were guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. PRISMA provides a standardized and evidence-based approach for reporting systematic reviews, ensuring transparency, replicability, and methodological rigor (Page et al., 2021). By following this framework, the study establishes a clear audit trail of how the initial pool of records was refined into the final dataset for analysis. As illustrated in Figure 1, the process began with the Identification phase, where 200 records were retrieved from Google Scholar. In the Screening phase, 150 records were retained after initial filtering, while 50 documents—specifically conference papers, books, and book chapters—were excluded to ensure that only peer-reviewed journal articles were considered. During the Eligibility phase, 100 records were further assessed for relevance to the research objectives, resulting in the exclusion of 45 studies due to lack of thematic alignment. Finally, in the Included phase, a total of 55 studies were deemed suitable and were incorporated into the

bibliometric analysis, providing a focused and relevant dataset for examining trends in Indigenous resources in education.
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III. RESULTS AND DISCUSSION

Keyword Co-occurrence Network

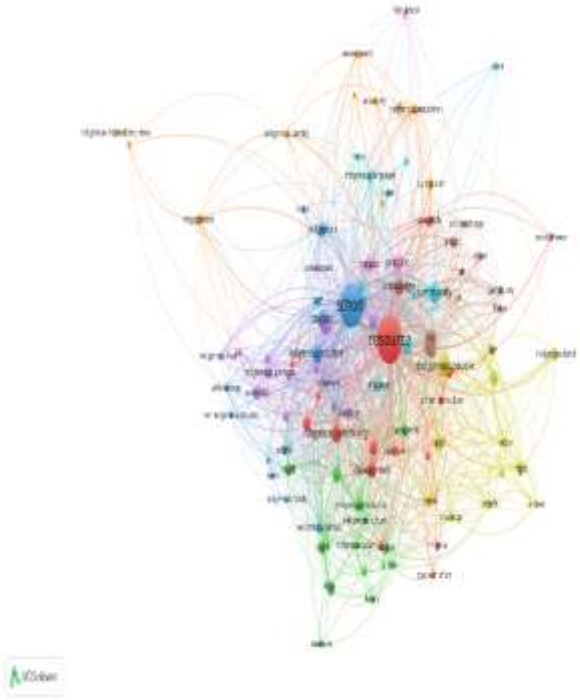

Figure 2. Keyword Co-occurrence Network on Indigenous Resources in Education

The illustration below presents the bibliometric analysis of keywords, specifically the keyword co-occurrence network, related to Indigenous resources and education. The node size reflects the frequency of each keyword's appearance, while the connecting lines represent the co-occurrence of the keywords in the same publication. A shorter distance between two nodes indicates a higher frequency of co-occurrence between those keywords. The keywords were grouped into five distinct themes based on clustering.

Community-Based Practice and Knowledge (Red Cluster)
This cluster anchors the map and includes keywords such as resource, community, knowledge, practice, language, and development. The centrality of the term "resource" within this cluster suggests that in this field, resources are not viewed as static tools but are deeply intertwined with community and practice. It emphasizes that the development of educational materials is inextricably linked to Indigenous knowledge systems and the preservation of language (Morrison, 2025; Bastida, 2023). This cluster highlights a trend in the literature that is moving away from external resource imposition toward community-led development frameworks, where local knowledge is the primary driver of educational practice (Esparrago-Kalidas, 2025).

Institutional Education and Student Achievement (Blue Cluster)
School, student, Indigenous student, achievement, and *access* are the dominant terms in this cluster, which delineates the formal institutional landscape. This theme focuses on the systemic experiences of students within the education systems. It addresses structural variables, such as the "achievement gap" (implied by terms like "difference " and "achievement"), and issues of access (Perkins, 2015; Deonandan, 2019). The literature in this cluster likely examines how formal schooling structures interact with Indigenous student populations and the systemic barriers—such as funding cuts and post-pandemic learning loss—that exist within standardized education (Jones, 2023; Diaz-Collazos, 2024).

Indigenous Rights, Land, and Legal Frameworks (Yellow Cluster)
This cluster encompasses words such as Indigenous people, land, rights, *law, consent,* and *benefit.* It represents a critical divergence from standard educational research by connecting pedagogy directly to political and legal sovereignty. In this cluster, "resources" are framed not just as classroom materials, but as *land* and natural resources (Rights and Resources Initiative, 2015). The presence of terms like *'law ' and 'consent ' indicates a body of research arguing that Indigenous education cannot be separated from the broader struggle for land rights, legal recognition, and environmental stewardship, often invoking frameworks such as* Free, Prior, and Informed Consent (Klein, 2023; OHCHR, 2013).

Holistic Health and Youth Well-being (Green Cluster)
This cluster contains keywords such as *health, child, Indigenous youth, family,* and *well-being.* It signifies a holistic approach to the learner, extending the scope of research beyond academic metrics to include physical and mental health. The inclusion of *family* and *child* suggests that the literature views the student not as an isolated learner, but as a member of a family unit whose educational success is dependent on broader social and health determinants (Shankar et al., 2013). Recent studies in this area emphasize that "well-being" is often grounded in connectedness to family and community rather than just individual health metrics (Waters et al., 2024; Gubhaju et al., 2019).

Identity and Engagement (Orange Cluster)
Although smaller, this distinct cluster directly connects Indigenousidentity with *engagement* and *instructiona l resources*. It highlights psychological and cultural aspects of learning, emphasizing how the reinforcement of Indigenous identity acts as a catalyst for student engagement. This suggests that resources that affirm identity are effectively used as tools

to increase participation and a sense of belonging in educational settings (Cameron, 2024; Suarta et al., 2022).

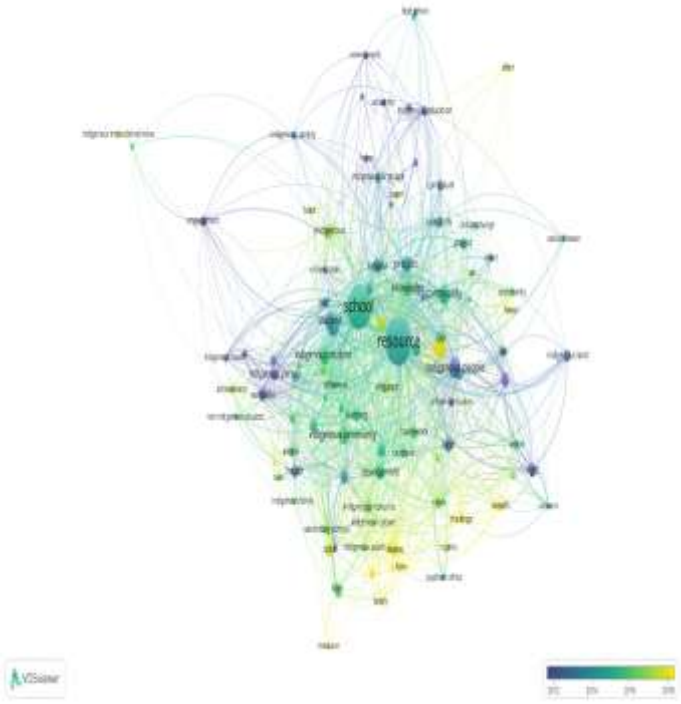

Figure 3. Overlay Visualization of Terms on Indigenous Resources in Education

As presented in the figure, the overlay visualization is a bibliometric analysis of relevant keywords over time regarding Indigenous education and resources. The node sizes represent the frequency of keyword appearance, and the links illustrate the co-occurrence of keywords in the same publication. The shading on the node transitions from blue to yellow, indicating the average publication year (2012–2018) of the keyword's mention.

The blue-to-purple coded nodes, such as school, student, achievement, access, and difference, refer to earlier studies conducted and are more focused on foundational institutional structures, comparative achievement gaps, and systemic access in nations like the United States and Australia. Conversely, the yellow-coded nodes, which include Indigenous land, rights, consent, climate change, and Indigenous identity, denote a shift toward political sovereignty, environmental stewardship, and holistic well-being.

Therefore, it can be inferred that the trend in Indigenous education research has moved from institutional and deficit-based comparisons toward rights-based, land-centric, and identity-affirming approaches (Datta, 2024; Persaud, 2025).

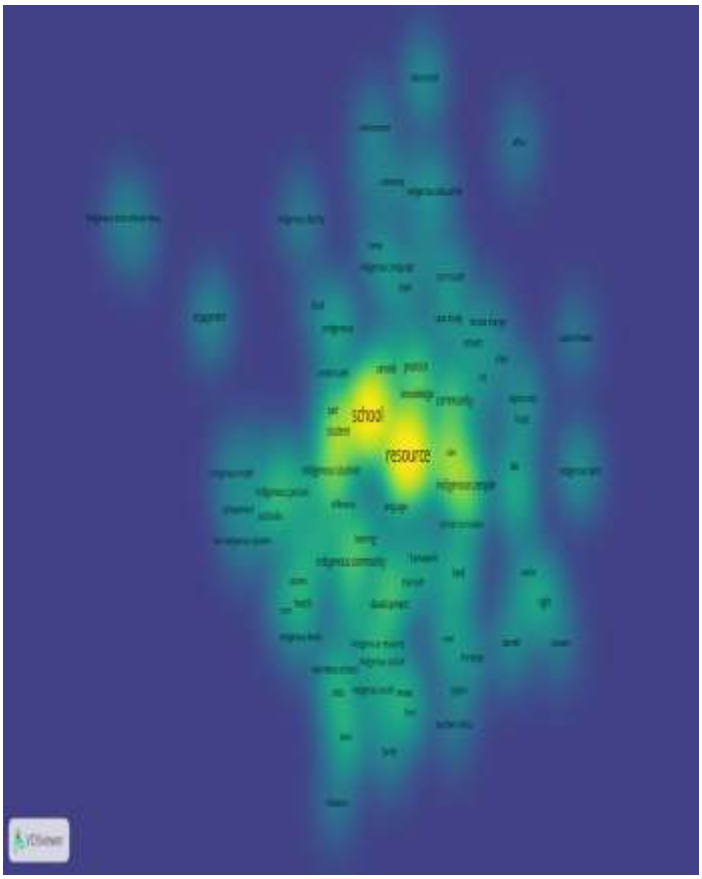

Figure 4. Density Visualization of Terms on Indigenous Resources in Education

The figure above presents a density visualization of keywords within the research landscape on indigenous resources in education. In this visualization, the color spectrum represents the concentration of research activity: warmer colors (yellow to green) indicate “hot spots” with a high frequency of keyword co-occurrence and scholarly attention, while cooler colors (blue to violet) signify “cold spots” associated with less explored or emerging themes. The map reveals a strong clustering of research around three interconnected pillars—school, resource, and community—suggesting that the current body of literature is largely grounded in the practical integration of formal education systems and resource distribution within community contexts.

The prominent yellow concentration at the center indicates that a significant portion of existing studies focuses on the intersection of schooling processes and resource allocation, particularly in supporting indigenous learners and improving access to culturally relevant education (People for Education, 2018; Smith, 2012). Furthermore, the observed density suggests that while structural components such as schools and educational resources have reached a level of research maturity or saturation, there remains considerable opportunity for thematic expansion, particularly in areas related to identity, land, and cultural sustainability (Battiste, 2013).

Notably, the high density surrounding the terms "community" and "practice" highlights a shift in the field from purely theoretical discussions toward applied, community-centered approaches. This transition underscores the importance of participatory and culturally grounded educational practices that empower indigenous communities and promote inclusive learning environments (Persaud et al., 2025; Brayboy & Maughan, 2009). Moving forward, emerging research is likely to bridge peripheral yet critical themes—such as climate change, indigenous rights, and environmental stewardship—into the central discourse, thereby enriching the scope and impact of indigenous education studies.

Year of Publication of Articles

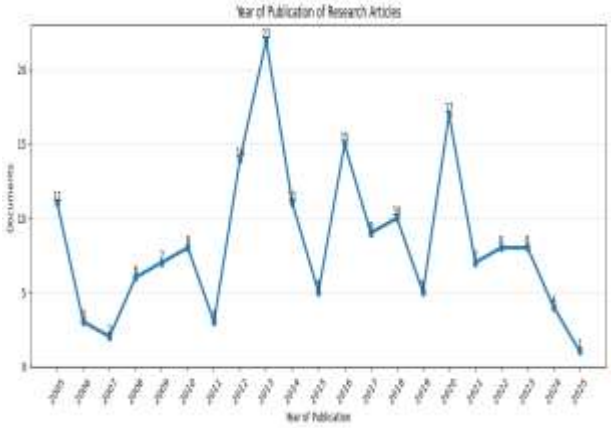

Figure 5. Year of Publication of Indigenous Resources in Education

The figure indicates that publications on education research resources are unevenly distributed over time, with low and fluctuating output from 2005 to 2011, marked peaks in 2013, 2016, and 2020, and fewer papers in the most recent years; this pattern shows that research competence evolved from a niche topic to a central concern in the 2010s, likely driven by evidence-based practice initiatives, reforms in graduate research training, and efforts to build research capacity in higher education, while the post-2020 decline may reflect indexing delays or a temporary shift of attention to other priorities (such as pandemic-related studies) rather than a true waning of interest. It reflects a clear publication trend toward increasing attention, but uneven development, in the field of Indigenous knowledge in education. Rather than focusing on what the studies say, the pattern of citations (Dwi et al., 2025; Yip & Chakma, 2024; Seleke et al., 2025) suggests that recent years have seen a growing volume of research, particularly clustered around similar concerns. This indicates that the topic is emerging as a priority area, attracting more scholars across different contexts.

However, the repetition of similar "gaps" across multiple recent publications points to a convergence trend—where many studies are identifying the same unresolved issues. This typically happens in fields that are still developing or transitioning, where research output is increasing faster than theoretical consolidation. In other words, while publications are becoming more frequent, they are not yet producing a unified or widely accepted framework.

Ten Most-cited Articles

Table 1. Ten Most-cited Articles on Research Competence

Rank	Articles	Citations
1	PasBartlett, C., Marshall, M., & Marshall, A. (2012) – "Two-eyed seeing and other lessons learned within a co-learning journey of bringing together indigenous and mainstream knowledges and ways of knowing" – Journal of Environmental Studies and (Springer), the here the reference, following APA 7th edition WITHOUT DOI or link.	52
2	Barnhardt, R. et al. (2005). – "Indigenous knowledge systems and Alaska Native ways of knowing" – Anthropology & Education (Wiley Online Library),	46
3	Castagno, A. E., & Brayboy, B. M. K. J. (2008). – "Culturally responsive schooling for Indigenous youth: A review of the literature" – Review of Educational (SAGE),	42
4	McCarty, T., & Lee, T. (2014). – "Critical culturally sustaining/revitalizing pedagogy and Indigenous education sovereignty" – Harvard Educational Review,	35
5	McCarty, T., & Lee, T. (2014). – "Critical culturally sustaining/revitalizing pedagogy and Indigenous education sovereignty" – Harvard Educational Review	29
6	Smith, L. T. (2015). – "Decolonizing methodologies: Research and Indigenous peoples" – book (Zed Books and later others)	26
7	Wilson, S. (2008). "Research is ceremony: Indigenous research methods" – book (Fernwood Publishing)	19
8	Kovach, M. (2009). – "Indigenous methodologies: Characteristics, conversations, and contexts" – book (University of Toronto Press)	16
9	Smith, L. T., Tuck, E., & Yang, K. W. (2018). – "Indigenous and decolonizing studies in education: Mapping the long view" – edited volume chapter/book section (Routledge)	11
10	Chilisa, B. (2012). – "Indigenous research methodologies" – book (SAGE Publications)	9

The table indicates that the most-cited works on education resources are strongly anchored in literature that emphasizes Indigenous education and decolonizing approaches. Influential

texts, such as McCarty and Lee's (2014) discussion of culturally sustaining pedagogy and Indigenous education sovereignty, alongside Smith's (2015) foundational work on decolonizing methodologies, highlight the importance of designing and utilizing educational resources that are culturally relevant and grounded in Indigenous knowledge systems. Similarly, Wilson's (2008) *Research is Ceremony* and Kovach's (2009) *Indigenous Methodologies* frame educational resources not merely as instructional tools, but as relational and context-based practices that must remain accountable to Indigenous communities.

Taken together, the high citation counts of works like Smith, Tuck, and Yang (2018) and Chilisa (2012) suggest that education resources in Indigenous contexts are increasingly viewed as instruments for empowerment, cultural preservation, and self-determination. These works imply that effective educational resources go beyond technical content delivery, instead integrating ethical considerations, cultural responsiveness, and community engagement. Overall, the table reflects a shift in the field toward recognizing that meaningful educational resources for Indigenous learners must center Indigenous epistemologies, challenge colonial structures, and support inclusive and community-driven educational practices.

IV. CONCLUSION AND RECOMMENDATIONS

This study conducted a bibliometric analysis of literature on Indigenous resources in education from 2005 to 2025, focusing on keyword co-occurrence, publication trends, and highly cited scholarly works. The findings show that research in this field is structured around interconnected themes that emphasize the central role of education resources in supporting Indigenous learners, particularly through the dynamic relationship between schools and communities. Over time, there has been a clear shift in publication trends—from earlier studies that concentrated on access, achievement, and institutional support, toward more recent scholarship that prioritizes culturally grounded educational resources, Indigenous knowledge systems, identity affirmation, and holistic well-being. Citation patterns further reveal that the most influential works frame education resources as culturally responsive, community-driven, and aligned with decolonizing and Indigenous paradigms.

Despite this progress, several research gaps remain evident. While school- and community-based educational resources are well established in the literature, emerging areas such as climate change education, land stewardship, and legal frameworks for Indigenous consent are still underrepresented. These findings suggest the need for future research to move beyond viewing Indigenous knowledge as supplementary and instead position it as a foundational element in the development of educational resources. Strengthening community-led, interdisciplinary, and context-specific approaches will be essential in advancing the field. Expanding studies across diverse Indigenous contexts and levels of education can further inform policy and practice, ultimately contributing to the creation of more inclusive, culturally sustaining, and rights-based education systems that genuinely reflect and uphold Indigenous epistemologies.

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