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ASSESSMENT LITERACY MEASURES: A COMPREHENSIVE BIBLIOMETRIC ANALYSIS

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Abstract:

Assessment literacy, a crucial component in education, plays a pivotal role in ensuring effective teaching and learning outcomes. The growing complexity and diversity of assessment practices in education underscore the necessity for educators to possess a nuanced understanding of assessment literacy. Despite its acknowledged importance, a consolidated overview of the research efforts in assessment literacy measures is lacking. This bibliometric review aims to investigate the scholarly landscape surrounding assessment literacy measures systematically. By delving into the literature, this study seeks to uncover research trends, influential contributors, and co-authorship countries' collaboration within the realm of assessment literacy in education. Scopus, a widely recognized scholarly database, serves as the primary source for this bibliometric review. A systematic search strategy employing relevant keywords and inclusion criteria retrieves a comprehensive dataset. Bibliometric indicators, including citation analysis, co-authorship networks, and keyword co-occurrence, are utilized to analyze and visualize the intellectual structure of assessment literacy measures research. The examination of keyword trends is anticipated to provide valuable insights into emerging areas of interest, illuminating the evolving discourse within the field. This thorough analysis aims to propel the field forward by addressing current challenges and inspiring future innovations in assessment literacy measures within the educational landscape.

Keywords:

Assessment Literacy, Assessment Knowledge, Instrument, Measure, Education

Introduction

Assessment literacy serves as a fundamental pillar in the realm of education, intricately interwoven into the very fabric of effective teaching and learning methodologies (DeLuca, LaPointe-McEwan, and Luhanga, 2016; Khadijeh and Amir, 2015; Pastore and Andrade, 2019). In the ever-evolving landscape of modern education, the significance of assessments has surpassed traditional metrics, taking on a more complex and multifaceted character. The demand for educators to possess a nuanced understanding of assessment literacy has reached an unprecedented level of urgency (Malone, 2013; Vogt and Tsagari, 2014). In this context, this bibliometric review endeavors to decipher the scholarly terrain surrounding assessment literacy measures. As educational systems globally grapple with the challenges and opportunities presented by the evolving landscape of assessment practices, a thorough exploration of research initiatives in assessment literacy becomes indispensable. Despite its widely acknowledged importance, a noticeable gap, a lack of a consolidated overview, exists, and it is this gap that this review aims to comprehensively address, offering a panoramic insight into the evolution and current state of assessment literacy research.

The evolution of assessment practices in education underscores the critical need for educators to navigate an increasingly intricate web of evaluation methods. The diversity in assessment approaches, from traditional exams to innovative performance-based assessments, necessitates a robust foundation in assessment literacy (Lim Hooi Lian and Wun Thiam Yew, 2016; Shin, 2015). This entails understanding the mechanics of different assessment tools and the ability to make informed decisions about when and how to employ them. As educators strive to cultivate environments that foster meaningful learning experiences, the intersection of effective teaching and comprehensive assessment literacy becomes a focal point. Against this backdrop, this bibliometric review explores the multifaceted dimensions of assessment literacy measures within the field of education. The nuanced understanding of assessment literacy, encompassing the knowledge, skills, and attitudes required for proficient assessment practices, has become more imperative than ever for educators and stakeholders alike (Hum and Choi, 2020; Taylor, 2013). However, despite its critical significance, a notable gap exists in the scholarly discourse—a comprehensive and up-to-date synthesis of the extensive research on assessment literacy measures.

Scopus, a widely recognized and comprehensive scholarly database, serves as the linchpin for this bibliometric exploration (Zhu and Liu, 2020). The choice of Scopus as the primary data source stems from its vast coverage of academic literature, ensuring a thorough and representative dataset for the analysis. A systematic search strategy, incorporating relevant keywords and stringent inclusion criteria, will be deployed to gather a comprehensive corpus of literature on assessment literacy measures. Through the lens of bibliometric indicators, such as citation analysis, co-authorship networks, and keyword co-occurrence, this review aims to quantify the scholarly impact of research in assessment literacy and map the intellectual structure of this dynamic field. In doing so, the review seeks to uncover key trends, influential contributors, and thematic concentrations, providing a panoramic view of the landscape of assessment literacy measures in education.

As this bibliometric review explores the intellectual terrain, the analysis of keyword trends emerges as a crucial facet of the investigation. The review aims to contribute valuable insights into the evolving discourse within the assessment literacy landscape by delving into the semantic evolution of research themes and emerging areas of interest. This comprehensive

analysis aims to propel the field forward, addressing current challenges and inspiring future innovations in assessment literacy measures within the educational context. Moreover, this review aspires to be a chronicle of scholarly contributions and a guiding compass for educators, researchers, and policymakers navigating the intricate waters of assessment literacy in contemporary education.

Literature Review

Assessment literacy, a cornerstone in the field of education, has garnered increasing attention in recent years as assessment practices have evolved in complexity and diversity. The literature reveals a consensus among scholars regarding the fundamental role assessment literacy plays in enhancing the effectiveness of teaching and improving learning outcomes (Malone, 2013; Scarino, 2014). Furthermore, assessment literacy is not merely a technical skill. It encompasses a deep understanding of the principles underlying assessment design, implementation, and interpretation. Hence, numerous scholars have underscored the critical importance of educators possessing a comprehensive grasp of assessment literacy to navigate the varied landscape of evaluation methods and to make informed decisions about their application (Moneyam, Abdullah, and Zaini, 2022; Xu and Brown, 2017). Scholarly contributions in assessment literacy extend to examining the impact of assessment practices on students, educators, and educational systems. In addition, researchers have explored how assessment literacy influences pedagogical approaches and contributes to equitable evaluation practices.

The literature highlights the need for educators to go beyond traditional assessment methods, such as standardized testing, and embrace innovative and formative assessment practices (Acar-Erdol and Yildizli, 2018; Akhtar, Hussain, and Nasir Ahmad, 2021). These insights are critical in evolving educational paradigms emphasizing student-centered learning and continuous improvement. Consequently, the literature emphasizes the significance of assessment literacy measures to empower educators to adapt to and effectively implement new assessment methodologies (Sultana 2019; Zulaiha, Mulyono, and Ambarsari, 2020). Moreover, the dynamic nature of assessment literacy is evident in the evolving definitions and frameworks proposed by scholars in the field. Early discussions primarily centered on the technical skills required for effective assessment. However, contemporary literature extends the definition to include a broader spectrum of competencies, encompassing ethical considerations, cultural sensitivity, and the ability to interpret and use assessment data to inform teaching practices (Ara and Saeed, 2020; Koh et al., 2018; Soleman, Marandi, and Tajik, 2021; Zolfaghari and Ahmadi, 2016).

The literature on assessment literacy measures reflects a growing recognition of the pivotal role assessment literacy plays in shaping educational practices and outcomes (Yan and Pastore, 2022). Assessment literacy is a multifaceted concept encompassing educators' and students' understanding of assessment purposes, methods, and the meaningful use of assessment data. Furthermore, scholars emphasized the importance of going beyond traditional notions of assessment literacy, which primarily focused on technical skills, to embrace a broader and more holistic perspective (Hussain, Idris, and Akhtar, 2021; Oo, Alonzo, and Asih, 2022). This evolution in the conceptualization of assessment literacy underscores its relevance in modern education, where assessment practices have become increasingly diverse and complex. Notably, one central theme in the literature revolves around defining the components of assessment literacy. Scholars agree that assessment literacy extends beyond test construction and scoring mechanics. Additionally, it involves the ability to design valid assessments,

interpret results effectively, and utilize assessment data to inform instructional decisions (Inbar-Lourie, 2012; Ricky Lam, 2015; Zolfaghari and Ashraf, 2015). This expanded definition acknowledges the dynamic interplay between assessment literacy and effective teaching. As such, the literature emphasizes the need for educators to develop a comprehensive set of competencies that contribute to a culture of continuous improvement in teaching and learning.

Several studies delve into the practical aspects of enhancing assessment literacy among educators. Professional development initiatives and training programs are identified as effective means to cultivate assessment literacy. The literature emphasizes the importance of integrating assessment literacy into teacher education curricula, ensuring that future educators are equipped with the necessary skills and knowledge (Bourenane, 2022; Szarka, Szököl, and Vargova, 2022; Tayyebi, Abbasabady, and Abbassian, 2022). Additionally, the impact of technology on assessment literacy is a recurrent theme, with scholars exploring how digital tools and platforms contribute to innovative assessment practices and the development of educators' technological literacy (Rezai et al., 2021; Toprak Yıldız, 2019). Despite the growing body of literature on assessment literacy, there remains a notable gap in consolidating and systematically analyzing the extant research efforts. This literature review underscores the necessity for a comprehensive bibliometric analysis to gain a macroscopic view of the scholarly landscape, identify influential contributors, and uncover thematic concentrations within the domain of assessment literacy measures in education. Moreover, the forthcoming bibliometric review, titled "Instruments of Insight," thus aims to fill this void by providing a data-driven synthesis of the research efforts in assessment literacy. It also provides researchers, educators, and educational policymakers a valuable resource.

In conclusion, the literature on assessment literacy measures reveals a dynamic landscape marked by an evolving understanding of assessment literacy, strategies to enhance educator and student assessment literacy, and the interconnectedness of assessment literacy with effective teaching and learning. As education transforms, the literature calls for ongoing research, innovative interventions, and a holistic approach to assessment literacy that addresses the diverse needs of educators and students alike. This comprehensive review lays the foundation for future investigations and interventions in the realm of assessment literacy measures, contributing to the ongoing improvement of educational practices and outcomes.

Research Question

1. What are the research trends for assessment literacy measures according to the year of publication?
2. Who are the most influential authors related to the study?
3. What are the types of documents by subject of research?
4. What are the top ten numbers of citations by research?
5. What are the popular co-occurrence keywords related to the study?
6. What are co-authorship countries' collaboration?

Methodology

Bibliometrics refers to integrating, organizing, and analyzing bibliographic data derived from scientific publications (Fahimnia, Sarkis, and Davarzani, 2015). In addition to basic descriptive information, such as publishing journals, publication year, and major author classification, it includes advanced approaches like document co-citation analysis. To achieve a successful literature review, it is essential to follow a systematic procedure that includes identifying

relevant keywords, conducting a thorough literature search, and analyzing the collected information. Hence, this iterative approach ensures the creation of a comprehensive bibliography and reliable outcomes. Given this, the study aimed to concentrate on high-quality publications since they provide useful insights into the theoretical viewpoints that influence the development of the research field. In order to guarantee the reliability of the data, the study utilized the Scopus database for data collection (Tan, Fu, and Ho, 2014). Furthermore, to guarantee the incorporation of top-notch publications, only articles published in meticulously peer-reviewed scholarly journals were considered, deliberately excluding books and lecture notes (Liu et al., 2015). Scopus, a well-known Elsevier database, was used to gather a wide range of publications from 2010 to December 2023 for further study.

Data Search Strategy

The study utilized a screening process to identify the specific search phrases for retrieving articles. The study began by searching the Scopus database using the online TITLE-ABS-KEY search terms "assessment literacy," "assessment knowledge," "assessment practice," "instrument," "measure," "development," and "education." This search resulted in a total of 1,126 publications. Subsequently, the query string was modified according to the criteria of inclusion and exclusion (refer to Table 2). A total of 466 results were obtained using this method. These results were then examined to include only research papers written in English, while excluding article reviews. Consequently, the ultimate refining of the search term (refer to Table 2) comprised a total of 466 publications, which were utilized for bibliometric analysis. Incorporated in the study were all papers from the Scopus database that pertain to assessment literacy and specifically focused on measures as of December 2023.

Table 1: The Search String

Database	Search String
Scopus	TITLE-ABS-KEY ("assessment literacy" OR "assessment knowledge" OR "assessment practice" AND instrument OR measure OR development AND education) AND (LIMIT-TO (SUBJAREA , "SOC")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (PUBYEAR , 2010) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023))

Table 2: The Selection Criterion

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2010 – 2023	< 2010
Literature type	Journal (article)	Conference, Book, Review
Publication Stage	Final	In Press
Research Area	Social Sciences	Besides Social Sciences

Data Analysis

VOSviewer, or Visualization of Similarities in Science, is a widely used software tool for bibliometric analysis, renowned for its intuitive interface and dynamic visualization features. Recognized for its proficiency in generating network visualizations representing relationships like co-authorship, co-citation, and keyword co-occurrence (Deng and Xia, 2020). VOSviewer employs clustering algorithms to unveil thematic groups and research communities. It provides a detailed understanding of structural dynamics in a specific field. Beyond its visualization features, VOSviewer provides performance metrics, including citation counts and h-index, offering quantitative insights into the impact and influence of authors and documents (Lai, 2020). Furthermore, regular updates by developers keep VOSviewer current with the latest bibliometric methodologies, establishing it as a dynamic and evolving tool in the field. In summary, VOSviewer stands as a comprehensive tool, providing a robust platform for researchers to conduct in-depth bibliometric analyses, with its user-friendly navigation, dynamic visualisations, and compatibility with diverse data formats setting it apart. In our study on assessment literacy measures, we accessed datasets from the Scopus database spanning the years 2010 to December 2023. The datasets, provided in PlainText format, included crucial information such as publication year, title, author names, journal details, citations, and keywords. Utilizing VOSviewer software (version 1.6.19), we conducted a thorough analysis, employing VOS clustering and mapping techniques to generate insightful maps.

Result and Finding

RQ1: What Are The Research Trends For Assessment Literacy Measures According To The Year Of Publication?

Figure 1 summarizes the distribution of publications related to assessment literacy measures and reveals interesting patterns and trends over the past 14 years. This analysis provides valuable insights into the evolution and prominence of research in this field. The overall trend in the number of publications demonstrates a general increase over the years, with a peak in 2023, where 64 publications were recorded. This steady rise suggests a growing interest and focus on assessment literacy measures within the academic community. The escalating numbers may indicate the increasing recognition of the importance of assessment literacy in education and other related fields. The initial years from 2010 to 2013 exhibit a gradual but somewhat modest publication growth.

However, from 2014 onwards, there is a noticeable acceleration in the publication rate, with a peak in 2023. This upward trajectory could be attributed to several factors. It may reflect a growing awareness of the significance of assessment literacy in educational practices, prompting researchers to explore and contribute to the existing body of knowledge. Examining the data more closely, the years 2019 to 2023 stand out as a period of substantial growth, with an average of 44.2 publications per year during this timeframe. This surge could be influenced

by emerging educational trends, policy changes, or an increased demand for effective assessment practices in response to evolving educational landscapes. Hence, it would be interesting to investigate the specific events or developments that might have contributed to this notable uptick in publications during these years.

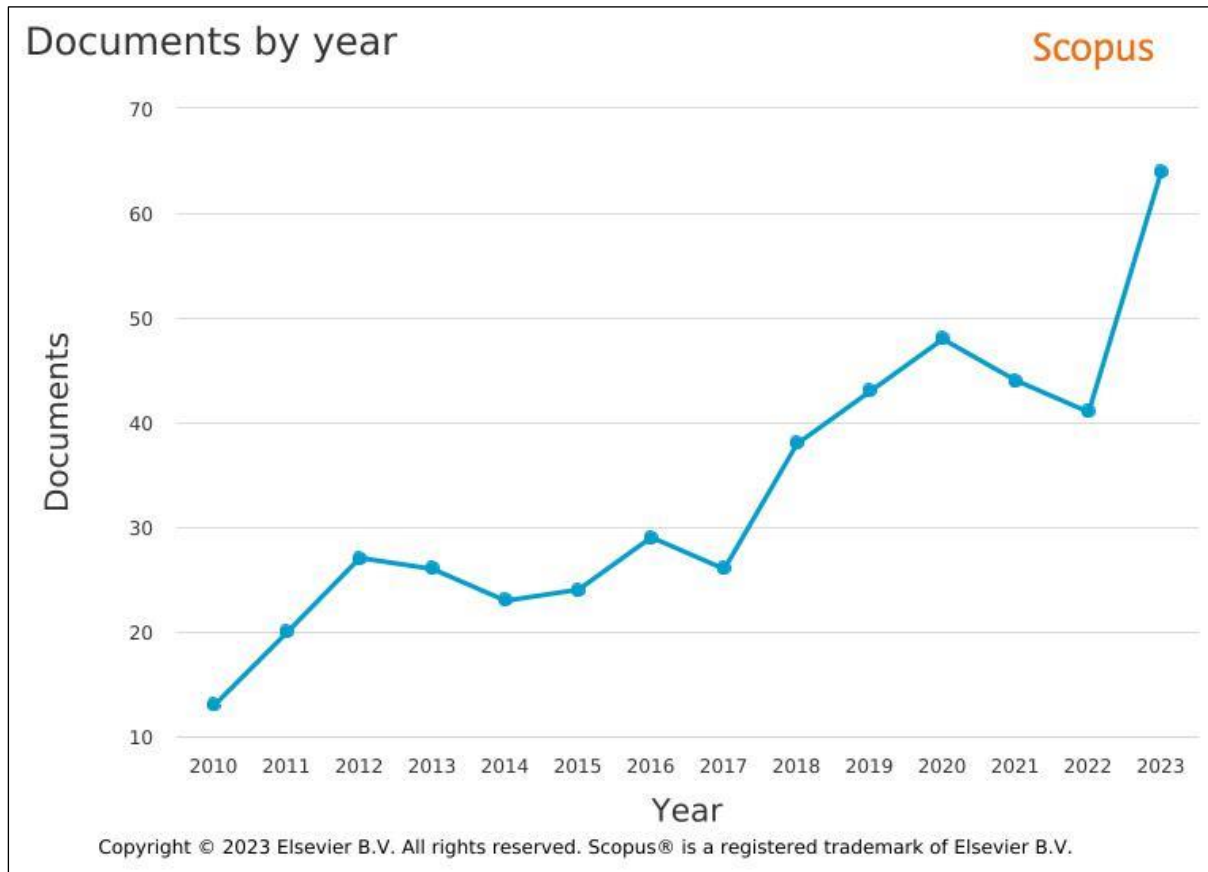


Figure 1: Distribution of Publications According to Year

In conclusion, the bibliometric analysis of assessment literacy measures from 2010 to 2023 illustrates a progressive increase in research output, suggesting a growing interest and emphasis on this critical aspect of education. Further investigation into the specific drivers behind these trends and an exploration of the content and outlets of these publications could enhance our understanding of the evolving landscape of assessment literacy research.

RQ2: Who Are The Most Influential Authors Related To The Study?

The bibliometric analysis of influential authors in the field of assessment literacy measures highlights key contributors who have significantly shaped the academic discourse (Figure 2). Notably, Lam, R. and Nortvedt, G.A. have made substantial impacts, each with four publications indicating a sustained and profound engagement with assessment literacy. Therefore, exploring the thematic focus of their work is crucial to understanding the specific contributions to the evolving knowledge in this area. Following closely are Alonzo, D., Boud, D., Davison, C., DeLuca, C., Klenowski, V., Medland, E., Panadero, E., and Reimann, N., forming a group that collectively influences the discourse on assessment literacy measures. The shared commitment among these authors suggests a collaborative effort to advance knowledge

in the field. Hence, investigating potential collaborations and synergies within this group could uncover common themes or methodologies that have shaped the assessment literacy literature.

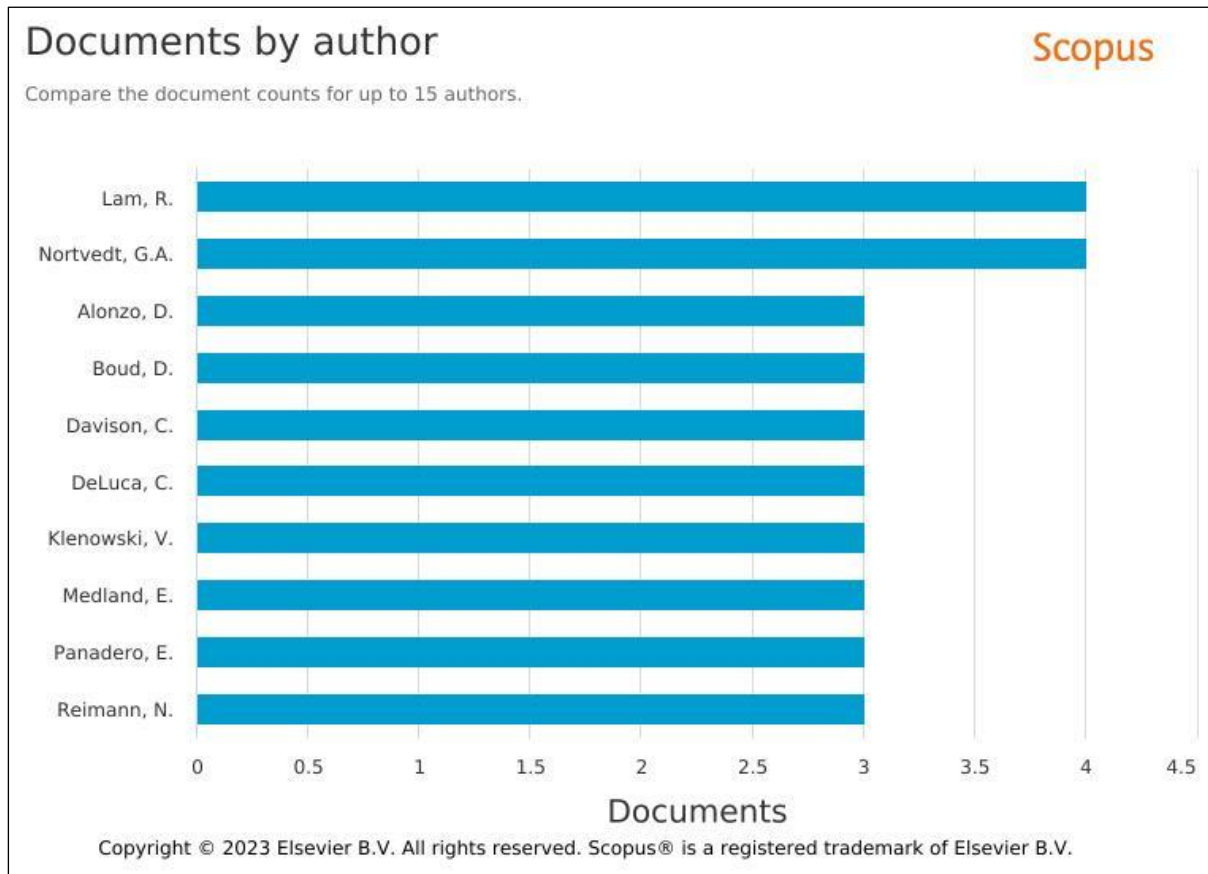


Figure 2: The Most Influential Authors Related to The Study

An in-depth exploration of the individual contributions of Alonzo, Boud, Davison, DeLuca, Klenowski, Medland, Panadero, and Reimann is crucial for understanding the diverse perspectives shaping assessment literacy research. Analyzing their unique approaches, theoretical frameworks, and the impact of their work on educational practice or policy can contribute to a nuanced understanding of the field's development. Thus, this bibliometric analysis sets the stage for further research, inviting scholars to delve into the specific works of these influential authors, ultimately advancing our comprehension of assessment literacy measures and their implications for education.

RQ3: What Are The Types Of Documents By Subject Of Research?

The bibliometric analysis of assessment literacy measures, categorized by subject areas, provides a comprehensive overview of the interdisciplinary nature of research in this field (Figure 3). The dominance of Social Sciences with 466 publications underscores the pervasive impact of assessment literacy across various educational contexts. This suggests that scholars within social sciences actively explore and contribute to the understanding of assessment literacy, reflecting the broad relevance of this topic in education. The substantial number of publications in this category may indicate a growing recognition of the importance of assessment literacy in shaping pedagogical practices and educational policies. While Social Sciences lead, Arts and Humanities, Psychology, and Health Professions follow, with 9.2%,

5.3%, and 3.5% publications, respectively. The presence of assessment literacy research in Arts and Humanities emphasizes the interdisciplinary nature of the field, demonstrating how assessment practices extend beyond traditional educational disciplines. Meanwhile, the contributions from Psychology and Health Professions reflect the interest in understanding the psychological and health-related implications of assessment literacy. This showcases the broader impact on learners' well-being and the healthcare education system.

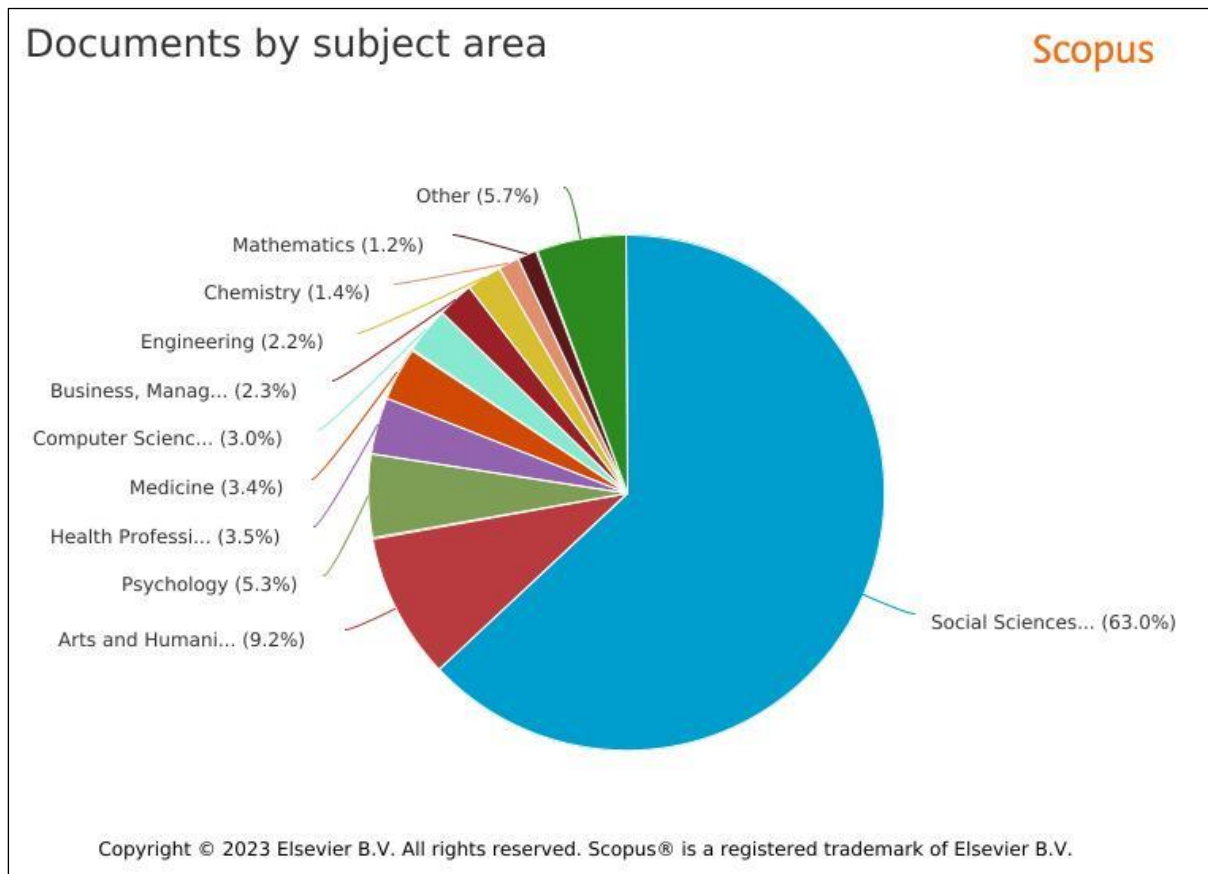


Figure 3: The Type of Documents by Subject of Research

Looking further into the distribution of publications, it is intriguing to note the representation of assessment literacy research in fields such as Computer Science, Business, Management and Accounting, Engineering, and other scientific disciplines. The inclusion of Computer Science, for instance, may signify the intersection of technology and assessment practices, reflecting the influence of digital tools in modern educational assessment. The varied distribution across disciplines highlights the interdisciplinary collaboration required to comprehensively address assessment literacy, as it involves aspects related to pedagogy, psychology, technology, and health professions. Future research could explore the connections between these subject areas, fostering a more holistic understanding of assessment literacy and its applications across diverse academic domains. In conclusion, the bibliometric analysis reveals the widespread influence of assessment literacy measures across various subject areas. At the same time, the dominance of Social Sciences and the substantial representation in Arts and Humanities, Psychology, and Health Professions underscores the multidisciplinary nature of research in this field. The distribution across various disciplines reflects the interconnectedness of assessment literacy with diverse aspects of education, indicating the need for collaborative efforts among

researchers from different fields to advance our understanding and practices in assessment literacy.

RQ4: What Are The Top Ten Numbers Of Citations By Research?

The top ten most cited research articles in assessment literacy measures paint a vibrant picture of a diverse, influential, and globally relevant field (Table 3). From clinical training to language testing, assessment literacy research tackles a vast array of educational contexts and influences practices with lasting impact.

Table 3: The Top Ten Number of Citation by Research

Authors	Title	Source Title	Cited by
Cate O.T.et al (2016)	Entrustment Decision Making in Clinical Training	Academic Medicine	285
Kingston, ; Nash B. (2011)	Formative assessment: A meta-analysis and a call for research	Educational Measurement: Issues and Practice	254
Watling C.J.; Ginsburg S. (2019)	Assessment, feedback and the alchemy of learning	Medical Education	182
Deluca C.; Klingerb D.A. (2010)	Assessment literacy development: Identifying gaps in teacher Candidates' learning	Assessment in Education: Principles, Policy and Practice	171
López-Pastor V.M. et al (2013)	Alternative assessment in physical education: A review of international literature	Sport, Education and Society	157
Harris P. et al (2010)	Competency-based medical education: Implications for undergraduate programs	Medical Teacher	125
Adachi C.; Hong-Meng Tai J.; Dawson P. (2018)	Academics' perceptions of the benefits and challenges of self and peer assessment in higher education	Assessment and Evaluation in Higher Education	124
Zlatkin-Troitschanskaia O.; Shavelson R.J.; Kuhn C. (2015)	The international state of research on measurement of competency in higher education	Studies in Higher Education	114
Eva K.W. et al (2016)	Towards a program of assessment for health professionals: from training into practice	Advances in Health Sciences Education	108
Lam R. (2015)	Language assessment training in Hong Kong: Implications for language assessment literacy	Language Testing	105

At the forefront are studies like Cate et al. (2016) on clinical training decision-making and Kingston and Nash's (2011) meta-analysis on formative assessment, each wielding over 200 citations. These pioneering works not only shaped critical discussions within their respective areas but also laid the groundwork for broader debates and research agendas. Watling and Ginsburg's (2019) exploration of the intricate link between assessment, feedback, and learning further underscored the enduring significance of highly cited research in guiding best practices across educational landscapes. In the field of educational assessment, Deluca and Klingerb (2010) conducted a study to identify the literacy gap in assessment among teacher candidates.

Beyond dominant themes, the most cited articles showcase the interdisciplinary nature of assessment literacy. López-Pastor et al.'s (2013) examination of innovative assessment methods in physical education and Harris et al.'s (2010) analysis of competency-based medical education exemplified the field's reach into distinct pedagogical spheres. Similarly, Adachi, Hong-Meng Tai, and Dawson's (2018) study on academics' perceptions of self and peer assessment in higher education highlighted the nuanced perspectives explored within this diverse field. The global footprint of assessment literacy research shines through in works like Zlatkin-Troitschanskaia, Shavelson, and Kuhn's (2015) comprehensive overview of competency measurement in higher education. It includes Eva et al.'s (2016) program for health professional assessment spanning training and practice. Meanwhile, Lam (2015) focused exploration of language assessment training in Hong Kong further underscored the international reach of this critical field. Collectively, these top-cited articles not only reflect the depth and breadth of assessment literacy research but also demonstrate its undeniable impact on shaping effective assessment practices across diverse educational contexts and professional domains.

RQ5: What Are The Popular Co-Occurrence Keywords Related To The Study?

The bibliometric analysis of assessment literacy measures unravels a nuanced landscape by identifying of three main distinct clusters, each denoted by a unique color, revealing key themes within the field (Figure 4). The red cluster centers on "assessment practices," emphasizing practical aspects with dominant keywords like "language assessment literacy," "classroom assessment," "feedback," "students," and "teaching." This cluster suggests a strong emphasis on implementing effective and tangible assessment methods. Meanwhile, the green cluster, focused on "theoretical frameworks," highlights keywords such as "standards," "humans," "human," "clinical competence," and "procedures," indicating a concern for the quality and accuracy of assessment practices with an emphasis on theoretical foundations. The yellow cluster, themed around "professional development," underscores the growing role in assessment practices, featuring keywords like "university," "human experiment," "learning," and "educational medical."

The connections and relationships depicted by lines connecting keywords unveil the interplay and co-occurrence of concepts, showcasing the intricate and multifaceted nature of assessment literacy. Strong links within the blue cluster indicate a holistic approach to practical assessment implementation. Furthermore, the pervasive presence of "assessment" and "literacy" across clusters suggests their overarching significance, serving as central themes that bridge different facets of assessment research. Hence, a deeper exploration of each cluster's keywords and cross-cluster connections is crucial for understanding specific research areas and relationships, placing these clusters within established theoretical frameworks or ongoing debates in the assessment field. While acknowledging the limitations of VOSviewer, such as its reliance on

keyword co-occurrence, this analysis lays the groundwork for future research directions. It also encourages a more in-depth exploration of specific themes and investigating relationships between keywords for a comprehensive understanding of assessment literacy measures.

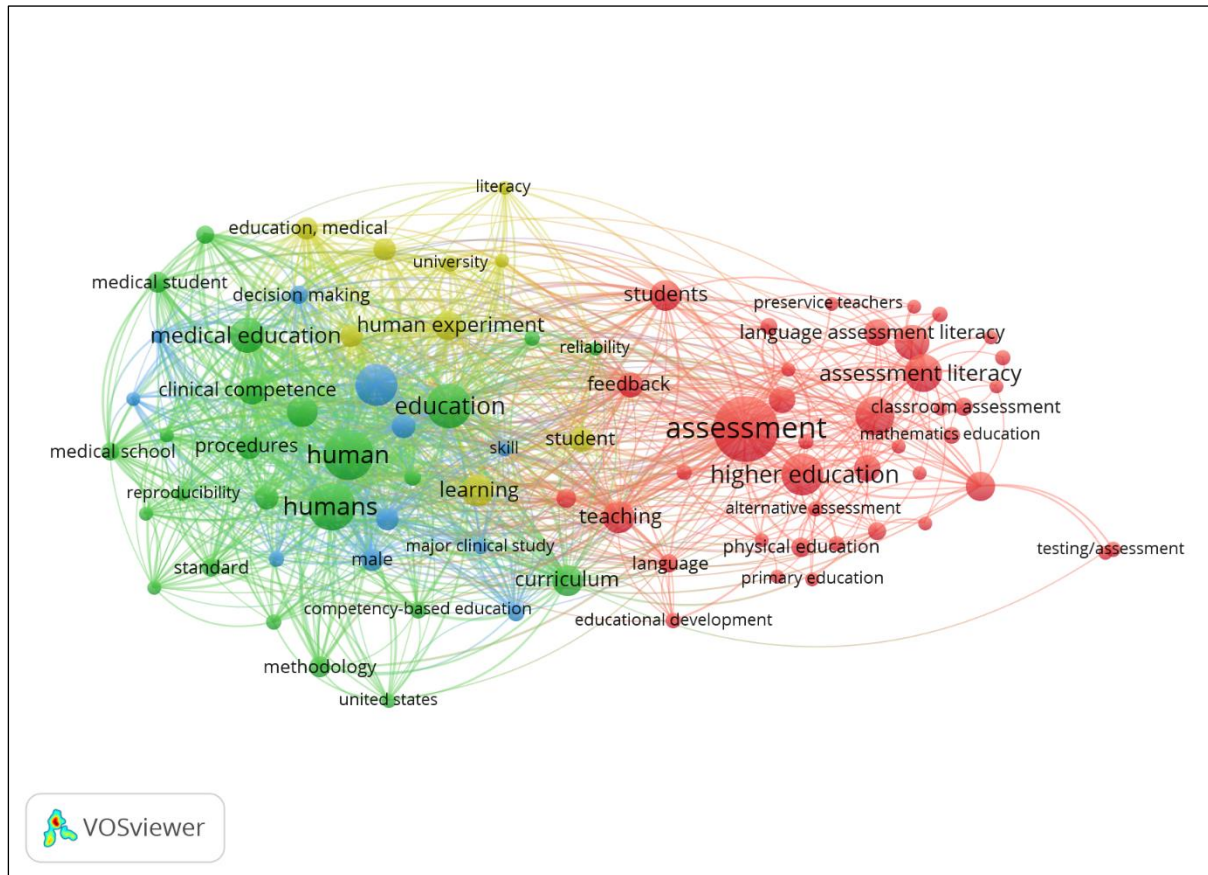


Figure 4: Network Visualization Map of Co-Occurrence Keywords

RQ6: What Are Co-Authorship Countries' Collaboration?

The VOSviewer map reveals a fascinating landscape of international collaboration in assessment literacy research (Figure 5). Three distinct clusters emerge, each representing a hub of active partnerships. The blue-green cluster, led by the Australia, suggests a robust network focused on English language assessment and related practices. This central position might be fueled by the widespread use of English in education and assessment, coupled with established research institutions and funding opportunities. Meanwhile, the green cluster showcases European collaboration, with Norway and Sweden as central nodes. This group likely delves into diverse European languages and assessment practices, potentially influenced by shared cultural contexts and educational policies. Interestingly, thinner lines connect this cluster to the blue one, hinting at occasional cross-regional partnerships and knowledge exchange. Finally, the purple cluster represents an emerging collaboration between Asian and United States. China, Hong Kong, and Singapore appear here, signifying the potential for future research partnerships and knowledge sharing across continents. This trend could lead to the development of culturally relevant assessment measures and a more globally inclusive research landscape.

The thickness of the lines connecting countries reveals the strength of their collaboration. Within each cluster, thicker lines like those between the United States and Canada indicate close research partnerships. Conversely, thinner lines like those between Europe and Asia suggest less frequent collaboration, though interestingly, some cross-cluster connections hint at growing international partnerships. For example, the line between the United States and China signifies potential knowledge exchange beyond regional boundaries, potentially driven by technological advancements and global educational initiatives. Furthermore, the map highlights the central nodes within each cluster. These countries, like the United States in the purple cluster or Netherlands in the red cluster, act as hubs for collaboration and knowledge dissemination. Therefore, analyzing the research topics associated with these central nodes could provide valuable insights into the thematic focus of each group and identify potential areas of collaboration or competition.

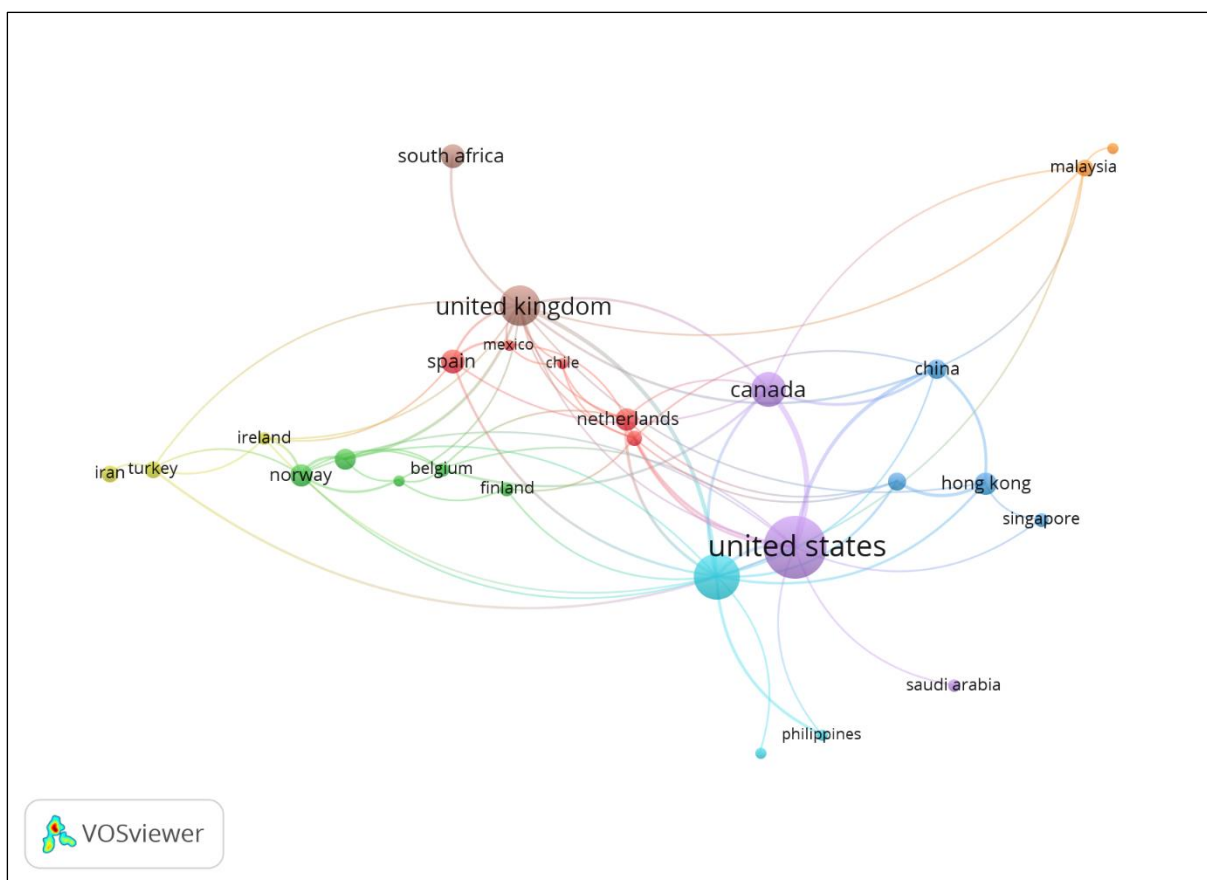


Figure 5: Network Visualization Map of Co-Authorship Countries' Collaboration

The observed collaboration patterns have significant implications for the future of assessment literacy research. The dominance of the Anglophone cluster underscores the need for increased research efforts and knowledge sharing with other regions. The rise of the Asian and South American cluster signifies the potential for more culturally relevant and globally inclusive assessment practices. Additionally, the growing cross-cluster collaborations highlight the importance of fostering international partnerships and knowledge exchange to address the diverse challenges and opportunities in assessment literacy research. Moving forward, bibliometric analyses using tools like VOSviewer can be combined with other methodologies to delve deeper into the specific research topics, funding opportunities, and institutional

collaborations driving these trends. Hence, by understanding the current landscape and potential future directions, researchers can contribute to building a more equitable and globally relevant field of assessment literacy.

Discussion

The bibliometric analysis of assessment literacy measures from 2010 to 2023 unveils a noteworthy upward trajectory in research output, indicating a growing interest and emphasis on this crucial aspect of education within the academic community. The overall trend demonstrates a steady increase in publications, reaching a peak of 64 in 2023, reflecting a heightened recognition of the importance of assessment literacy in education and related fields. Furthermore, the notable acceleration in publication rates from 2014 onwards, particularly from 2019 to 2023, suggests a dynamic period of substantial growth. It was influenced by emerging educational trends, policy changes, or an increased demand for effective assessment practices in response to evolving educational landscapes.

Some influential authors in the assessment literacy measures field highlighted the substantial contributions of researchers such as Lam, R., and Nortvedt, G.A., who have each authored four impactful publications. This suggests a sustained and meaningful engagement with assessment literacy, prompting further exploration into the specific themes and contributions of their work. Following closely, Alonzo, D., Boud, D., Davison, C., DeLuca, C., Klenowski, V., Medland, E., Panadero, E., and Reimann, N., each with three publications, collectively represent a significant influence on the discourse. The shared commitment among these authors to advancing knowledge in assessment literacy indicates a collective impact on the field. Hence, future research could investigate potential collaborations among these authors, revealing insights into the interconnectedness of their work and the emergence of common themes. Moreover, a detailed examination of the individual contributions of each author is essential for understanding the diverse perspectives shaping assessment literacy research, including their approaches, theoretical frameworks, and impact on educational practice or policy.

The categorization of publications by subject areas emphasizes the interdisciplinary nature of assessment literacy research and the imperative for collaborative endeavors across diverse academic domains. This aims to comprehensively address the multifaceted challenges and opportunities in assessment literacy. This also underlines the profound significance and global impact of assessment literacy research in molding effective assessment practices across a spectrum of educational contexts and professional domains. At the same time, Social Sciences emerged as the predominant domain with 466 publications, illustrating the pervasive impact of assessment literacy across diverse educational contexts. This dominance suggests active engagement from social science scholars in shaping pedagogical practices and educational policies, indicating a growing recognition of the topic's importance. Meanwhile, Arts and Humanities, Psychology, and Health Professions follow suit with 68, 39, and 26 publications, respectively, highlighting the interdisciplinary nature of assessment practices beyond traditional educational disciplines. Contributions from Psychology and Health Professions highlight a focus on learners' well-being and healthcare education implications. Furthermore, the inclusion of fields like Computer Science, Business, Management and Accounting, and Engineering underscores the intersection of technology with assessment practices, emphasizing the influence of digital tools in modern educational assessment. Thus, the varied distribution across disciplines emphasizes the need for collaborative efforts to comprehensively address assessment literacy, encompassing pedagogy, psychology, technology, and health professions.

The top ten most cited research articles in assessment literacy measures demonstrate the diverse and influential nature of this field, with studies spanning various educational contexts and influencing practices worldwide. These highly cited articles have shaped critical discussions within their respective areas and laid the foundation for broader debates and research agendas. It highlights the enduring significance of assessment literacy in guiding best practices across educational landscapes. Additionally, these articles showcase the interdisciplinary nature of assessment literacy, reaching into distinct pedagogical spheres and exploring nuanced perspectives. Overall, these top-cited articles reflect the depth and breadth of assessment literacy research and its undeniable impact on shaping effective assessment practices across diverse educational contexts and professional domains.

The bibliometric analysis of assessment literacy measures reveals four distinct clusters that represent key themes within the field: assessment practices, theoretical frameworks, technology and innovation, and social and educational contexts. The connections between keywords within each cluster highlight the interplay of concepts, while the presence of "Assessment" and "literacy" across clusters suggests their overarching significance. To enhance the analysis, a deeper exploration of each cluster's keywords, cross-cluster connections, and comparisons with existing literature is necessary. In addition, the VOSviewer map reveals three main distinct clusters of international collaboration in assessment literacy research, with the United States leading the purple cluster, United Kingdom leading the brown cluster, and Australia leading the green-blue cluster. The map also highlights the strength of collaboration through the thickness of lines connecting countries, with thicker lines indicating closer research partnerships. The findings emphasize the need for increased research efforts and knowledge sharing across regions and the potential for more culturally relevant assessment practices. It also highlights the importance of fostering international partnerships to address the challenges and opportunities in assessment literacy research. As researchers move forward, combining bibliometric analyses with other methodologies can offer deeper insights into specific research topics, funding opportunities, and institutional collaborations, contributing to the development of a more equitable and globally relevant field of assessment literacy.

Conclusion

In conclusion, the bibliometric analysis of assessment literacy measures from 2010 to 2023 demonstrates a progressive increase in research output, indicating a growing interest and emphasis on this critical aspect of education. Further investigation into the specific drivers behind these trends and exploring the content and outlets of these publications could enhance our understanding of the evolving landscape of assessment literacy research. Additionally, the analysis of influential authors highlights the contributions of key researchers in shaping the discourse on assessment literacy measures, inviting further exploration of their work. The categorization of publications by subject areas reveals the interdisciplinary nature of assessment literacy research and the need for collaborative efforts across various academic domains. The significance and impact of assessment literacy research in shaping effective assessment practices across diverse educational contexts and professional domains emphasizes the interdisciplinary nature of assessment literacy and the global reach of its research. Furthermore, it explores international collaboration in assessment literacy research, identifying three main distinct clusters that provides valuable insights into the future trajectory of assessment literacy research. The existence of these clusters highlights the need to foster global partnerships to address the diverse challenges and opportunities in the field, ultimately contributing to the continued evolution and advancement of assessment literacy research on a

global scale. Overall, this analysis contributes to understanding the evolving landscape of assessment literacy research and sets the stage for future inquiries into the driving forces behind these trends.

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