



Adaptive Learning Evaluation for Students with Special Needs: A Scopus Bibliometric Mapping and Its Blind Spot in Islamic Religious Education (2015–2025)

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ABSTRAK

Evaluasi pembelajaran adaptif bagi siswa berkebutuhan khusus dalam mata pelajaran Pendidikan Agama Islam (PAI) masih kurang berkembang, khususnya dalam mengakomodasi keragaman ekspresi pembelajaran agama yang mencakup aspek kognitif, afektif, spiritual, perilaku, dan sosial. Artikel ini memetakan penelitian global yang terindeks Scopus mengenai penilaian pembelajaran bagi siswa berkebutuhan khusus dalam rentang tahun 2015–2025, dengan menerapkan pendekatan tinjauan bibliometrik dan menguji-alih-alih sekadar berasumsi klaim bahwa PAI terputus dari literatur tersebut. Perangkat lunak Biblioshiny digunakan untuk menganalisis tren publikasi, jurnal produktif, penulis dan afiliasi yang berkontribusi, distribusi bidang subjek, kolaborasi internasional, dokumen yang paling banyak dikutip, struktur tematik, serta jaringan kemunculan bersama kata kunci. Selanjutnya, sebagai uji untuk melihat apakah topik PAI “dibungkam” atau tidak muncul dalam kumpulan data tersebut, dilakukan pencarian lanjutan yang secara khusus menargetkan kata kunci Islamic Education (Pendidikan Islam) dan Special Needs (Kebutuhan Khusus). Hasilnya menunjukkan tren peningkatan publikasi yang stabil, terutama setelah tahun 2020, dengan fokus kuat pada bidang Ilmu Sosial serta kontribusi dari psikologi, profesi kesehatan, dan ilmu komputer. Topik-topik utamanya meliputi pendidikan inklusif, siswa, kebutuhan khusus, serta evaluasi pembelajaran dan program. Topik mengenai machine learning dan lingkungan pembelajaran virtual masih tergolong baru dan sedang berkembang. Pencarian lanjutan mengonfirmasi bahwa PAI tidak sepenuhnya absen dari catatan Scopus, namun posisinya berada dalam klaster yang tipis, baru, dan sebagian besar terisolasi. Temuan ini mengindikasikan perlunya model evaluasi yang terdiferensiasi dan responsif terhadap siswa dalam konteks PAI, yang didasarkan pada literatur evaluasi khusus-sesuatu yang menurut tinjauan ini belum tersedia.

ABSTRACT

Evaluation of adaptive learning to students with special needs in Islamic Religious Education (PAI) is still less developed, especially in accommodating cognitive, affective, spiritual, behavioral, and social expressions of religious learning diversity. This article maps the global Scopus-indexed research on learning assessment for special needs students in the 2015–2025 range, applying bibliometrics review approach and testing rather than assuming – the claim that PAI is disconnected from the literature. Biblioshiny was used to analyze the publication trend, productive journals, contributing authors and affiliations, subject field distribution, international collaborations, most-cited documents, thematic structure, and co-emergence keyword network. Then, as a test of the dataset’s silencing against PAI, a further search was performed specifically targeting the keywords of Islamic Education and Special Needs. The results show a steady upward trend in publications, especially after 2020, with a strong focus on Social Sciences, with contributions from psychology, health professions and computer science. The main topics include inclusive education, students, special needs, learning and program evaluation. Machine learning and virtual learning environments are still emerging. A further search confirms that PAI is not entirely absent from Scopus records but is located in a thin, new and largely disconnected cluster. This finding indicates the need for a differentiated and responsive evaluation model to the students in PAI, based on specific evaluation literature which according to this review is not available yet.

KATA KUNCI

Asesmen pembelajaran adaptif; Pendidikan Agama Islam; siswa berkebutuhan khusus; pendidikan inklusif; tinjauan bibliometrik

KEYWORDS

Adaptive learning assessment; Islamic Religious Education; special needs students; inclusive education; bibliometric review

A. Introduction

Inclusive education in Indonesia has been a main focus in developing an education system that can reach all children, including children with special needs.¹ Based on data from the Ministry of Education, in 2024 there were around 146,205 students with special needs studying at inclusive schools throughout Indonesia.² However, only about 30% of the 1.6 million children with special needs are able to access formal education.³ These data show a large gap in achieving quality inclusive education.

Quality inclusive education is closely linked with Sustainable Development Goal (SDG) number 4 to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.⁴ This is vital to build a just and equitable society where all children, including those with special needs, have equal opportunities to learn and develop.⁵ One of the priority research areas in the National Research Master Plan (RIRN) is the development of education and the strengthening of human resources (HR) in line with the effort to create an inclusive education system that can reach all groups including children with special needs.

The Islamic Religious Education (PAI) is an important role in the education of children with special needs, not only as a source of knowledge but also in shaping the character and spirituality of children with special needs.⁶ However, the effectiveness of PAI learning for students with special needs requires an evaluation model that can be used to meet the needs of students individually. A suitable

¹ X Qu, "Structural Barriers to Inclusive Education for Children with Special Educational Needs and Disabilities in China," *Journal of Educational Change* 23, no. 2 (2022): 253–76, <https://doi.org/10.1007/s10833-021-09426-2>; Ş Elaldı, T Çifçi, and N S Yerliyurt, "A Meta-Analytical Evaluation of the Effectiveness of Inclusive Practices on Learning Outcomes," *Eğitim ve Bilim* 46, no. 207 (2021): 231–58, <https://doi.org/10.15390/EB.2021.9853>.

² I W Widana, I W Sumandya, and I W Citrawan, "The Special Education Teachers' Ability to Develop an Integrated Learning Evaluation of Pancasila Student Profiles Based on Local Wisdom for Special Needs Students in Indonesia," *Kasetsart Journal of Social Sciences* 44, no. 2 (2023): 527–36, <https://doi.org/10.34044/j.kjss.2023.44.2.23>; T Neneng, S Diana, and M Tias, "Teacher Information Literacy for Inclusive Early Childhood Education (ECE) to Provide Literacy and Numeracy for Special Needs Children in Central Java-Indonesia," *International Journal of Learning, Teaching and Educational Research* 22, no. 12 (2023): 262–78, <https://doi.org/10.26803/ijlter.22.12.13>.

³ H E Maolida and A Sofarini, "Go Hand in Hand: Showcasing Lecturers' Online Collaborative Teaching Practices," *Indonesian Journal of Applied Linguistics* 11, no. 3 (2022): 553–66, <https://doi.org/10.17509/ijal.v11i3.38533>.

⁴ M Karamani et al., "The Complex Journey towards the Enactment of Inclusion in Physical Education: A Scoping Review of the Literature on Teachers' Perceptions and Practices," *Physical Education and Sport Pedagogy*, 2024, <https://doi.org/10.1080/17408989.2024.2374263>; A Vuyk et al., "Gifted Education in Paraguay: Analyses from a Learning-Resource Perspective," *Cogent Education* 11, no. 1 (2024), <https://doi.org/10.1080/2331186X.2024.2332863>; T Hughes-Roberts et al., "Digital Game Making and Game Templates Promotes Learner Engagement in Non-Computing Based Classroom Teaching," *Technology, Knowledge and Learning*, 2023, <https://doi.org/10.1007/s10758-023-09654-w>.

⁵ H Widyaningsih et al., "Physical Education Learning Design with Augmented Reality for Special Needs Students," *International Journal of Human Movement and Sports Sciences* 11, no. 5 (2023): 1070–78, <https://doi.org/10.13189/saj.2023.110515>; W Udasmoro et al., "Student Perceptions towards the Implementation of Higher Education's Character Education Program: Challenges and the Role of the Academic Environment," *Research Journal in Advanced Humanities* 6, no. 2 (2025), <https://doi.org/10.58256/zev7a754>.

⁶ Fahmi Ulum Al Mubarak, Annas Fajar Rohmani, and Mahasri Shobahiya, "Transformasi Pendidikan Agama Islam: Tinjauan Aspek Psikologis, Filosofis, Dan Sosiologis Materi PAI Di SMP/MTs," *Iseedu: Journal of Islamic Educational Thoughts and Practices* 7, no. 2 (2023): 244–56.

adaptive evaluation model will assist students with special needs to achieve their maximum potential in learning PAI.

Although there are several studies on learning evaluations for students with special needs, only a few have developed adaptive evaluation models, especially in the context of Islamic Religious Education in inclusive schools.⁷ Most of the previous studies have focused on general aspects of learning and have not extensively developed evaluation models based on the specific profiles of students with special needs in the framework of PAI. This study thus aims to fill this gap by developing an evaluation model adapted to the specific needs of students with special needs in inclusive schools.

One of the ways to analyze and understand the dynamics of research related to inclusive education and PAI is through a bibliometric approach. The used method makes it possible to identify trends and patterns in the scientific literature, as well as to map the relationships between different concepts and theories related to the evaluation of learning of students with special needs. Bibliometrics can be used to reflect the degree of attention to the topic of adaptive evaluation in religious education and to evaluate the contributions of different studies in this field.

Thus, this study aims to answer some of the key research questions that will provide a comprehensive overview of the state and trends of research on the Adaptive Learning Evaluation Model for PAI Based on the Individual Profiles of Students with Special Needs in Inclusive Schools. This study aims to answer the following research questions:

1. What are the research trends on the “Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools” in terms of the amount of publications per year?
2. What are the journals with the most articles published on the subject “Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools”?
3. Which authors are the most productive in the Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools?
4. What fields of study or disciplines are involved in the research on the Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools?
5. What are the leading countries of the authors who contributed the most to the publications and research collaboration on Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools?

⁷ A Layachi and N J Pitchford, “Formative Evaluation of an Interactive Personalised Learning Technology to Inform Equitable Access and Inclusive Education for Children with Special Educational Needs and Disabilities,” *Technology, Knowledge and Learning*, 2024, <https://doi.org/10.1007/s10758-024-09739-0> ; B Berni Kelly et al., “Speak out, Stay Safe: Including Children with Special Educational Needs and Disabilities in an Evaluation of an Abuse Prevention Programme,” *Child Abuse Review* 32, no. 5 (2023), <https://doi.org/10.1002/car.2816>.

6. Which article has had the greatest influence in terms of number of citations in the research about the Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools?
7. What are the main themes that are prevalent and have the potential for future research on the Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools?

In addition, the study will also identify major trends in the literature related to adaptive evaluation through bibliometric analysis and will analyze the contributions of previous research to the development of learning evaluation models for students with special needs.⁸ The main problem presented in this research is the absence of adaptive, individual profile-based evaluation models, for students with special needs in learning, in inclusive schools. This restricts the effectiveness of learning and prevents it from being optimized. If this issue is not tackled, it could have serious theoretical and practical implications. The absence of adaptive evaluation models could theoretically hinder the development of inclusive learning theories that are in accordance with the individual needs of students. In practice, this could mean a decrease in the quality of education for students with special needs, who should receive learning adapted to their characteristics and needs.

From an academic point of view, the study is expected to be a significant contribution to the development of the theory of inclusive education, particularly in the area of evaluation of adaptive learning. It might also serve as a reference for the development of more inclusive policies and educational practices that are more responsive to the needs of the special needs students. Practically, the results of this study can be used by teachers of Islamic Religious Education in inclusive schools to apply more effective evaluation models, and further improve the quality of education for students with special needs.

B. The Bibliometric Workflow

The present study uses a bibliometric approach to analyze the trends and development of the research of the “Adaptive Learning Evaluation Model Based on the Individual Profiles of Students with Special Needs in Inclusive Schools”. Bibliometrics is a method to quantitatively evaluate and analyze scientific literature, which helps to identify trends, patterns, and contributions within a specific field.⁹

⁸ Fahmi Ulum Al Mubarak et al., “Tracing the Progression of Motivated Learning Strategies: An In-Depth Bibliometric Analysis,” *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, January 30, 2024, 450–60, <https://doi.org/10.23917/iseth.3895>.

⁹ Moch Yusril Rahmatillah Amien et al., “Unveiling the Post-Pandemic Pedagogical Shift: A Bibliometric Odyssey into Educational Technology Research on the Scopus Database (2020-2023),” *Proceeding ISETH (International Summit on Science, Technology, and Humanity)*, January 30, 2024, 2922–34, <https://doi.org/10.23917/iseth.5448> ; O E Ani, P Ngulube, and O B Onyancha, “A Bibliometrics Analysis of the Visibility of Library and Information Science Research in Nigeria in the Web of Science, 2000-2014,” *African Journal of Library Archives and Information Science* 27, no. 1 (2017): 41–51; A Lohia et al., “Bibliometric Analysis of One-Stage and Two-Stage Object Detection,” *Library Philosophy and Practice* 2021 (2021): 1–33.

The analysis process was carried out using R and R-Studio software, through the Biblioshiny analysis tool, which allows visualization and statistical computation of the bibliometric data obtained.

The first step of this bibliometric analysis is the data collection from the Scopus database which is well known for providing scholarly journal articles from various disciplines. The search was conducted in the first stage as follows: (TITLE-ABS-KEY (evaluation) AND TITLE-ABS-KEY (learning) AND TITLE-ABS-KEY (special need)). The search yielded 1,814 documents. These papers discuss different topics regarding evaluation of learning for students with special needs. However, filtering was applied depending on the publication year and other categories in order to improve the quality and relevance of the research topic, focusing on a more relevant scope. The inclusion criteria were as follows: (TITLE-ABS-KEY (evaluation) AND TITLE-ABS-KEY (learning) AND TITLE-ABS-KEY (special need)) AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ARTS")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) The search resulted in 273 total relevant articles.

The analysis was performed in line with PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) for systematic and transparent screening. In this process, articles that do not meet the topic or method criteria are eliminated. The remaining articles are then further analysed to identify the publication patterns, author trends and journal contributions. This analysis is performed by Biblioshiny which allows the user to create graphical visualizations and tables from the filtered data. This includes frequency graphs of publications per year, keyword analysis and dominant journals and authors in the field.¹⁰

The primary objective of this bibliometric analysis is to establish relevant publication patterns in the field of learning assessment for students with special needs and to identify the most significant authors, journals, and fields of study. It is expected that this analysis will lead to a better understanding of the developments and trends in research related to the Adaptive Learning Evaluation Model for PAI and will provide recommendations for further research in this area.

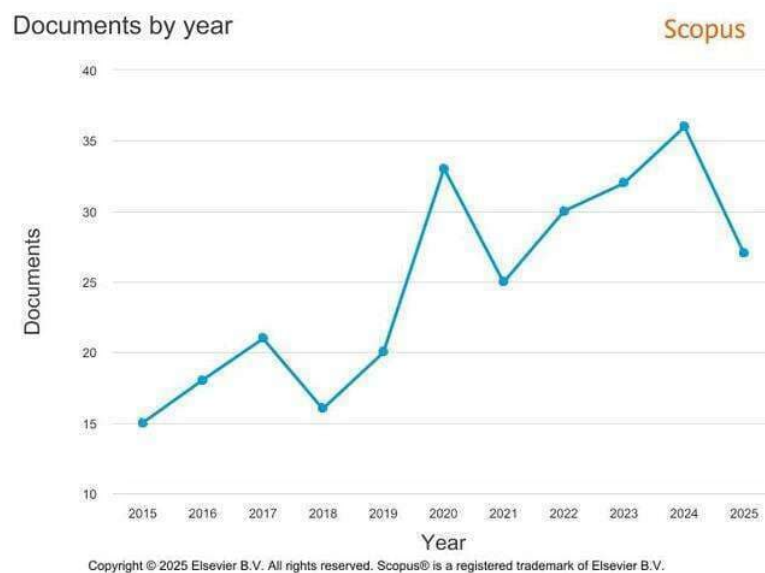
Since the main search string above did not include any terms of Islamic education, a supplementary search was run to test, rather than assume, the claim that Islamic Religious Education is disconnected from this literature. The search for the combination of terms Islamic religious education or Islamic education and special needs, inclusive education or disability, limited to 2015–2025, produced a small but real cluster of directly relevant Scopus-indexed work, including an analysis of inclusive education and justice for students with special needs in Indonesian madrasas¹¹ and a study on the integration of

¹⁰ Fahmi Ulum Al Mubarak et al., "Bibliometric Analysis of Game-Based Mobile Learning in Higher Education: Trends and Gaps," *Journal of Learning for Development* 12, no. 3 (November 18, 2025): 501–18, <https://doi.org/10.56059/jl4d.v12i3.2011>.

¹¹ Mira Mareta, Ade Alimah, and Muhammad Muhammad, "Inclusive Education and Justice for Students with Special Needs in Madrasas," *Ulmuna* 28, no. 2 (2024): 933–60, <https://doi.org/10.20414/ujiis.v28i2.862>.

Islamic values in inclusive madrasa education for special-needs students.¹² Islamic Religious Education is thus not absent from the Scopus record on inclusive and special-needs education, as an unqualified reading of the primary dataset might suggest, but thin, recent, and largely disconnected from the evaluation-specific literature mapped below. The Discussion returns to this distinction rather than to an outright absence

C. Bibliometric Findings



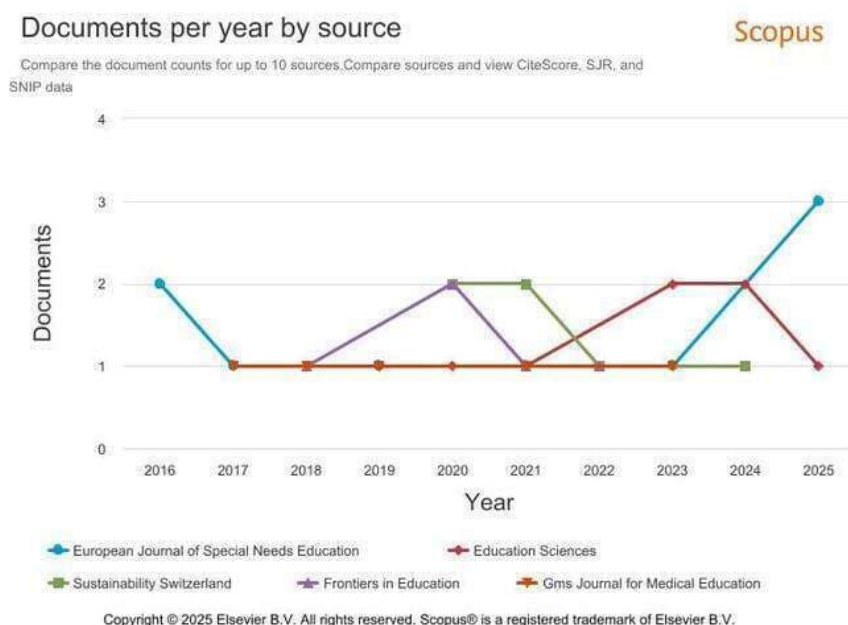
1. Publication Trends by Year

Figure 1. Document by Year

The annual publication trend in the Scopus dataset shows a clear long-term increase in the scholarly output on the topic between 2015 and 2025, but several fluctuations are present during the observation period. The publications grew continuously from 15 documents in 2015 to 21 in 2017, which shows an increasing academic interest in the early decade. This upward trend was interrupted in 2018, when the number of publications fell to 16 documents, but it recovered to 20 documents in 2019. The year 2020 was a breakthrough year. The number of publications increased sharply to 33 documents, the largest one-year increase in the dataset. This surge is likely due to increased research interest in response to emerging global educational challenges and the evolving discussions of multiculturalism, diversity and social justice. The publication output decreased to 25 documents in 2021, but the overall trend was positive, with the gradual recovery of research productivity in the following years, with 30 publications in 2022, 32 in 2023, and a peak of 36 publications in 2024. The apparent drop to 27 publications in 2025 should be taken with caution, as the year is probably still ongoing and indexing in the

¹² Rosidi Bahri, "Integrating Islamic Values in Inclusive Madrasa Education: A Unique Approach for Special Needs Students," *International Journal of Inclusive Education*, September 8, 2025, 1–17, <https://doi.org/10.1080/13603116.2025.2555397>.

Scopus database may not yet be complete. Overall, the publication trajectory suggests that the field has continued to grow in research activity over the last decade, indicating that it has gained increasing scholarly recognition and continues to attract substantial academic attention. The consistent increasing trend in publication volume, particularly after 2020, indicates the maturing of the research field and its growing importance in modern education and social science research.

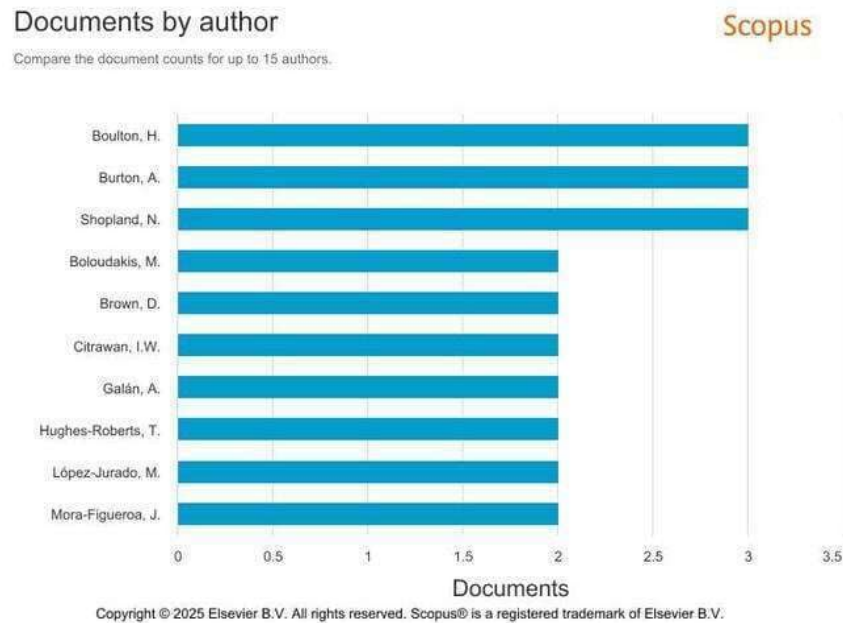


2. Most Productive Journals

Figure 2. Document by Each Source

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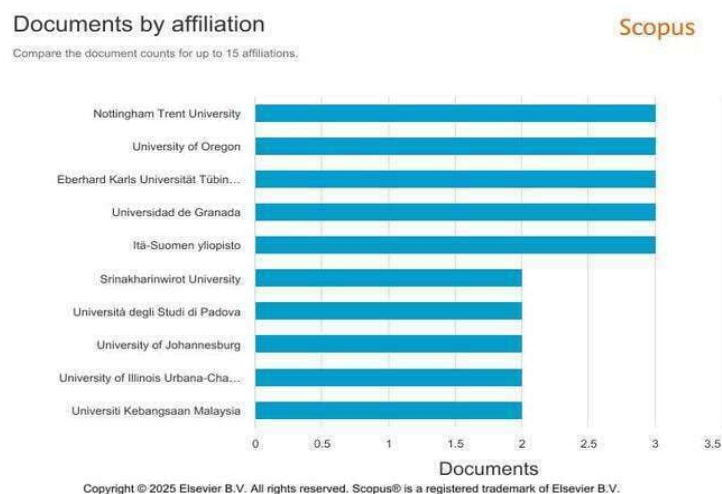
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3. Most Relevant Authors and Affiliations

Figure 3. Document by Author

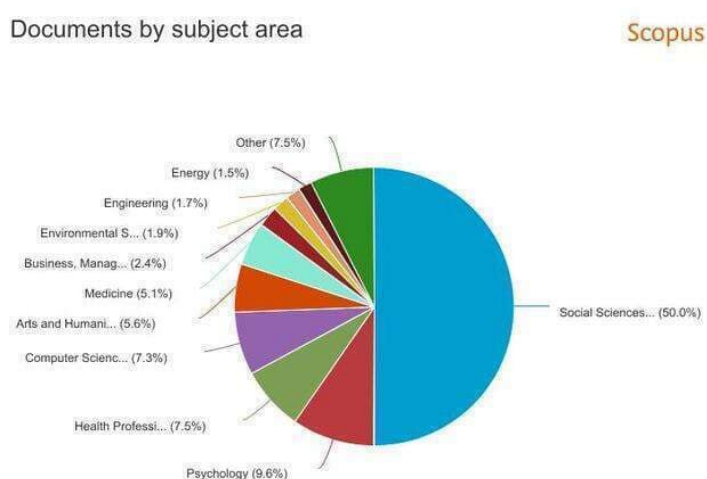
This graph presents the number of publications by different authors in journals indexed in Scopus. The most productive author is Boulton, H. with more than 3 documents, followed by other authors such as Burton, A., and Shopland, N., each with more than 2 documents, according to the data. Other authors such as Boloudakis, M., Brown, D., and Citrawn, I.W. contributed >1 document, while others such as Galán, A., Hughes-Roberts, T., López-Jurado, M., and Mora-Figueroa, J. contributed 1 document. This graph illustrates the great number of authors who have made important contributions to publications in their fields. H. Boulton as the author with



the most documents.

Figure 4. Document by Affiliation

Analysis of the most relevant affiliations highlights the distribution of research productivity across several higher education institutions from different geographical areas, emphasizing the international and collaborative nature of the field. The most productive institutions are: Nottingham Trent University (United Kingdom), University of Oregon (United States), Eberhard Karls Universität Tübingen (Germany), Universidad de Granada (Spain), and Itä-Suomen yliopisto (University of Eastern Finland), with three publications contributed to the Scopus dataset each. Their leading publication outputs suggest that these universities are significant hubs for the development of research on multicultural and inclusive education, showing strong institutional commitments to addressing current educational challenges through interdisciplinary scholarship. A second set of institutions, Srinakharinwirot University (Thailand), Università degli Studi di Padova (Italy), University of Johannesburg (South Africa), University of Illinois Urbana-Champaign (United States) and Universiti Kebangsaan Malaysia (Malaysia), each had two papers, showing that significant work comes from a wide range of academic settings across Europe, North America, Asia and Africa. This more equitable distribution of institutional productivity means that the research area is not dominated by a single university or national research center. Instead, knowledge is produced through the contribution of broad-based institutions across a range of educational systems and cultural settings. Such diversity is a great asset to the intellectual growth of the field, promoting comparative perspectives, cross-cultural dialogue and international collaboration. The pattern of affiliation is suggestive of the global relevance of the research topic and points to the continuing growth of this field, supported by an expanding network of universities that contribute to theoretical innovation, diversity of



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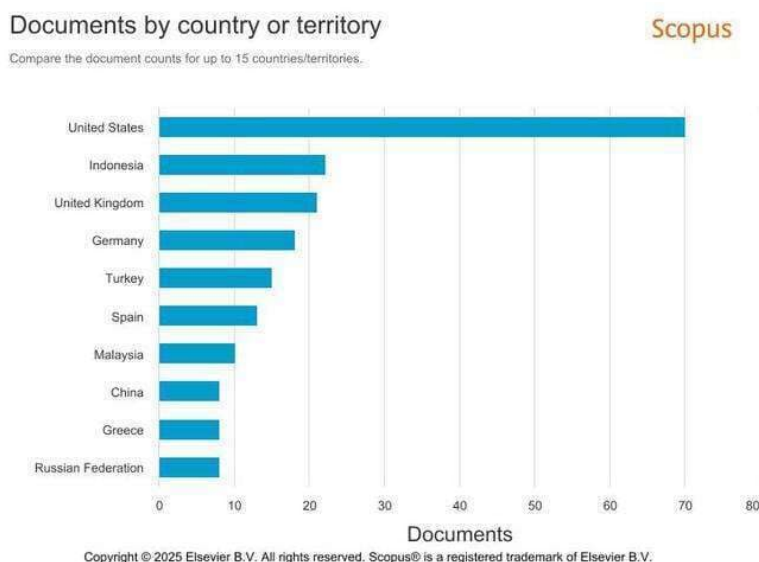
methodology and evidence-based practice in education.

4. Contributing Academic Disciplines

Figure 5. Document by Subject Area

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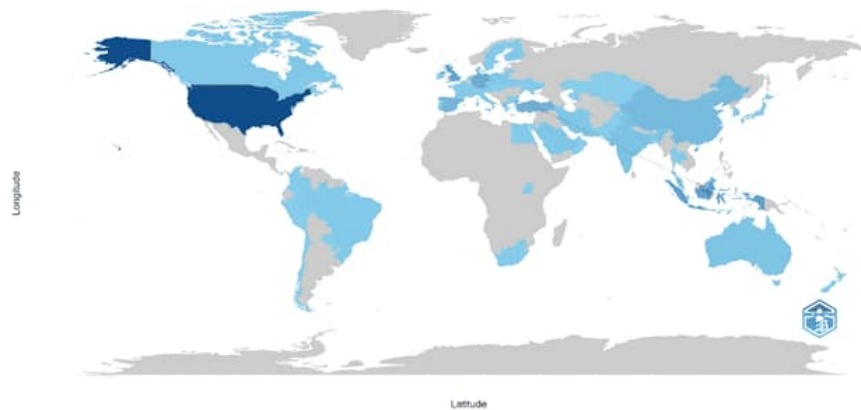
5. Leading Contributing Countries and International Collaborations

Figure 6. Document by Country

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Country Collaboration Map



methodology and evidence-based practice in education.

Figure 7. Country Collaboration Map

The data looks to be a collaboration map between countries with the columns From, To and Frequency. From indicates the country of origin for the collaboration, to indicates the collaborating country and Frequency measures the strength or frequency of the collaboration between the two countries. For example, Australia has the highest frequency of collaboration with India (79.61), whereas China has significant collaborations with some countries including Korea (127.84) and Slovenia (14.80). This data probably reflects international academic or research collaborations. It indicates the strength and distribution of collaborations between countries. It illustrates the changing nature of collaboration, identifying countries involved in the largest number of collaborations and the strength of these academic or research collaborations.

6. Most-Cited Articles

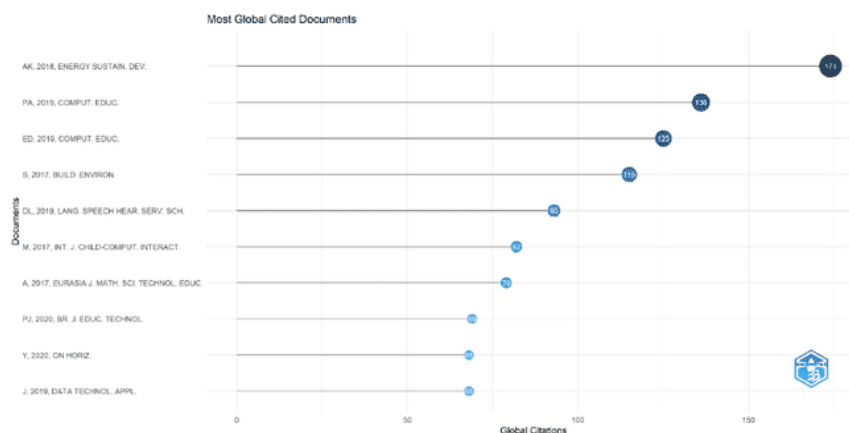
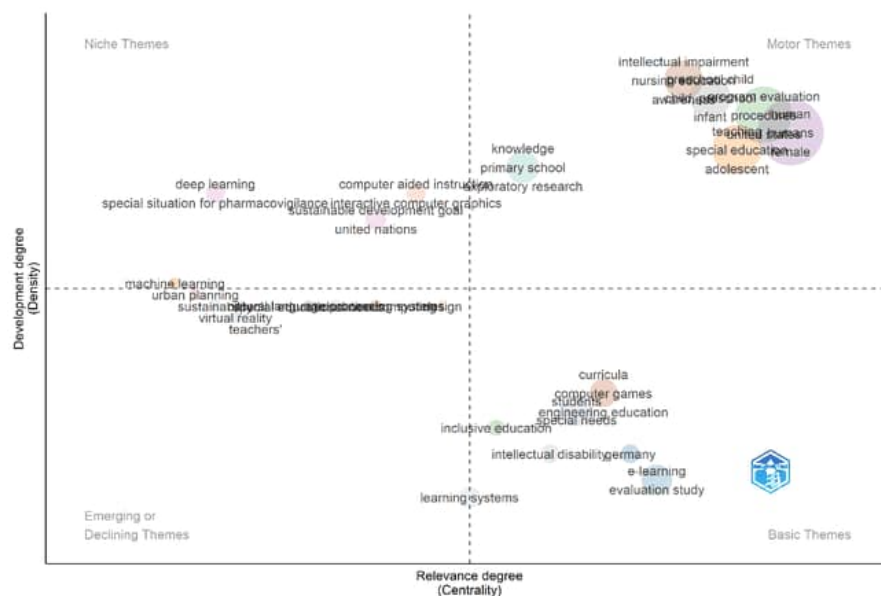


Figure 8. Most Global Cited Document

An analysis of contributing academic disciplines indicates that research in this field is highly interdisciplinary, but is overwhelmingly anchored in the Social Sciences which make up 50.0%

of all publications. This dominant share is the focal point of literature on educational theory, multicultural pedagogy, inclusion, social equity, and policy development. The second largest contributor is psychology with 9.6%, highlighting the importance of cognitive, behavioral and socio-emotional perspectives in understanding learning processes, identity formation and intercultural competence. Contributions from Health Professions (7.5%) and Computer Science (7.3%) reflect a growing convergence of educational research with professional training and digital learning technologies, indicating the need to explore multicultural and inclusive educational practices across diverse learning environments. Arts and Humanities (5.6%) and Medicine (5.1%) provide essential insights into culture, ethics, communication, and health education, thus broadening the scope further. Business, Management and Accounting (2.4%), Environmental Science (1.9%), Engineering (1.7%), and Energy (1.5%) also play a smaller yet significant role through exploring multicultural skills in business, technology, and sustainability frameworks. The remaining 7.5% of publications are distributed in other subject areas, which shows the wide applicability of the research beyond its traditional disciplinary borders. Overall, the distribution of topics confirms that the field has become a highly multidisciplinary domain in which the Social Sciences provide the main theoretical basis, while the complementary contributions of psychology, health sciences, technology and other disciplines enrich the conceptual, methodological and practical understanding of multicultural and inclusive education. This disciplinary diversity enriches the field and creates opportunities for cross-sector collaboration, methodological innovation, and expanding research relevance across different educational and professional settings.

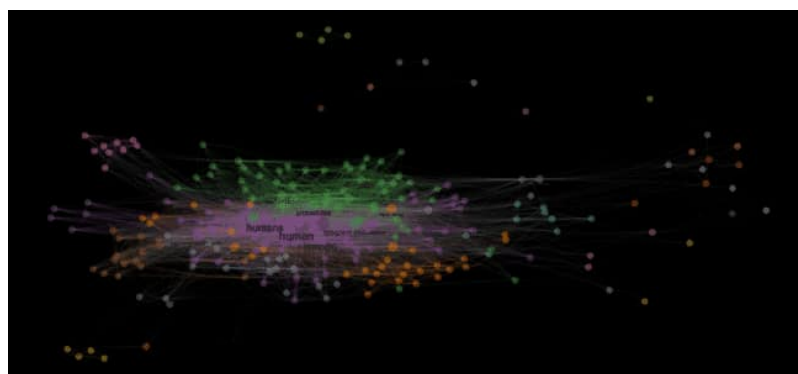


7. Key Research Topics, Current Trends, and Future Directions

Figure 9. Thematic Map

This graph is a thematic map that illustrates the relationship between different research themes on two dimensions: the degree of development (density) and the degree of relevance

(centrality). Lower-left quadrant themes include “machine learning,” “urban planning,” and “virtual reality,” which are emerging or declining areas of research. In contrast, themes in the upper-right quadrant such as “inclusive education,” “students,” and “special needs” are more relevant and mature, suggesting that these topics have a strong impact and high relevance in current research. Conversely, topics such as “intellectual impairment”, “nursing”, and “child development” are in the lower-right quadrant which represents important but not yet fully developed topics. The graph offers a look at the direction and trends of research, and it shows



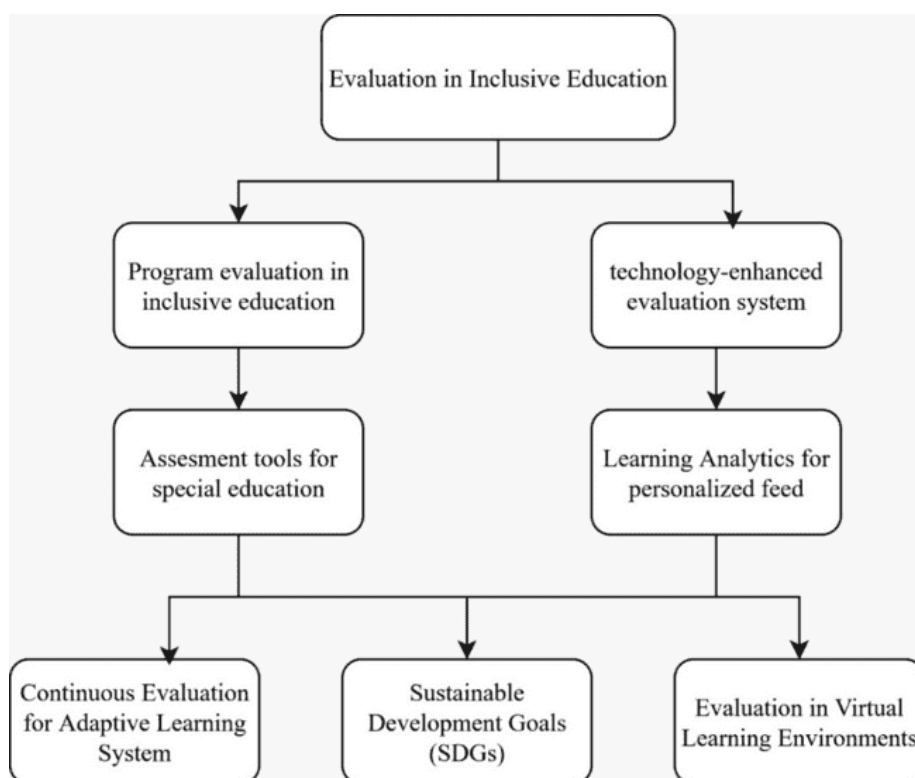
the depth and relevance of themes in education and technology.

Figure 10. Keyword network distribution

The keyword co-occurrence network shows a highly interconnected thematic structure, suggesting that research in this domain has evolved through a strong conceptual integration, rather than through isolated lines of inquiry. The central zone of the network presents a high density of nodes and links indicating the presence of several core keywords that act as intellectual hubs linking several research themes. The words human, humans, learning and program evaluation, which are near the center of the map, are highly connected and central, suggesting that they are the root concepts around which much of the literature is organized. The field is composed of several distinct but interrelated thematic domains as suggested by the multiple color-coded clusters. Each cluster represents a particular research focus, but there are still significant relationships between the clusters. The wide variety of links between clusters suggests that themes related to educational practices, human development, learning processes, curriculum evaluation, inclusion, and social dimensions are often investigated together, rather than separately. Meanwhile, a number of smaller peripheral clusters with fewer links represent specialized or emerging research topics not yet fully integrated into mainstream literature. These peripheral themes may point to new directions for research which are drawing increasing scholarly attention but have relatively little empirical development. The network topology is dense, with many links between the clusters and relatively short distances between the main nodes, indicating a mature and cooperative knowledge network, in which concepts are constantly interacting with each other. The map does not show hard thematic boundaries but rather a broad interdisciplinary convergence, implying that researchers are increasingly

combining perspectives from education, psychology, social sciences, health and evaluation studies to address complex issues in education. This pattern of interconnectivity shows that the field has transitioned from disjointed investigations to a coherent thematic network, backed by broad conceptual exchange, interdisciplinary collaboration, and cumulative knowledge development. The simultaneous presence of dominant central themes and emerging peripheral clusters also indicates that the research area is still expanding, while still having a stable core of intellectual development, which creates opportunities for future research to enhance the theoretical integration and to investigate the underexplored thematic linkages.

Figure 11. Conceptual Framework on Evaluation in Inclusive Education



This conceptual framework is aimed at Evaluation in Inclusive Education, with the goal of leveraging advanced technology to enhance the effectiveness and inclusivity of educational systems. It starts with the evaluation of inclusive education programs, making sure that the curricula and teaching methods meet the needs of all students, including those with special needs. Evaluation systems based on technology, such as learning analytics and AI, enable more individualized and accurate assessments.

In addition, special assessment tools are designed for students with special needs to ensure accurate evaluations of their developmental progress.¹³ Adaptive learning systems constantly

¹³ U M Abba and A M Rashid, "Teachers' Competency Requirement for Implementation of Inclusive Education in Nigeria," *Universal Journal of Educational Research* 8, no. 3 3C (2020): 60–69, <https://doi.org/10.13189/ujer.2020.081607> ; M Ahmad and S Khasawneh, "Role of Effective Assessment in Motivating

assess and adjust the learning process to the individual needs of students.¹⁴ Meanwhile, the inclusion of Sustainable Development Goals (SDGs) prepares students to face global challenges. Finally, the evaluation in virtual learning environments offers immersive learning experiences, allowing students to interact dynamically and be assessed in more interactive settings. Together these components form a responsive, data-informed and inclusive system of evaluation, which supports sustainable and adaptive educational goals.

D. Discussion

The bibliometric results show that research on learning evaluation for students with special needs has become an increasingly visible and interdisciplinary field, especially in the last decade.¹⁵ This is not simply a statistical sign of the growth of publications, but a sign of a deeper transformation in educational thought: evaluation is being more and more repositioned from a standardized mechanism of measurement to a more adaptive, inclusive, and learner-responsive pedagogical practice.¹⁶ This change is very relevant to Islamic Religious Education (IRE) in which the learning outcomes are not only cognitive mastery but also include spiritual awareness, moral reasoning, affective development, ritual practice and social responsibility. The bibliometric evidence therefore suggests that IRE needs a model of assessment capable of identifying different kinds of religious learning in students with special needs, rather than the use of uniform standards of assessment which may inadvertently perpetuate exclusion.¹⁷

There is an increasing trend of publications from 2015 to 2025, particularly after 2020, which suggests that the evaluation of learning of students with special needs has become more pressing in response to global concerns of inclusion, educational equity, digital transformation, and differentiated learning.¹⁸ But the increase in the number of publications should not be taken as evidence that the field is conceptually mature. The bibliometric pattern indicates that inclusive education and special needs have become central themes, while the evaluation of adaptive learning is unevenly theorized and inconsistently operationalized. This gap is especially significant for IRE, because religious education

Students with Learning Difficulties in Primary Schools from Teachers' Perspectives in Abha," *International Journal of Learning, Teaching and Educational Research* 23, no. 7 (2024): 461–75, <https://doi.org/10.26803/ijlter.23.7.23>.

¹⁴ E Chernobay and D Tashibaeva, "Teacher Professional Development in Russia and Kazakhstan Evidence from TALIS-2018," *Voprosy Obrazovaniya / Educational Studies Moscow*, no. 4 (2020): 141–64, <https://doi.org/10.17323/1814-9545-2020-4-141-164>.

¹⁵ N Taja et al., "Character Education in the Pandemic Era: A Religious Ethical Learning Model through Islamic Education," *International Journal of Learning, Teaching and Educational Research* 20, no. 11 (2021): 132–53, <https://doi.org/10.26803/ijlter.20.11.8>.

¹⁶ M R Fauzi, T Hamami, and H.-J. Kim, "Islamic Religious Education Curriculum Innovation: Fethullah Gülen's Perspective," *Jurnal Pendidikan Agama Islam* 21, no. 1 (2024): 186–200, <https://doi.org/10.14421/jpai.v21i1.7089>.

¹⁷ C Suwanbamrung, "Children's Basic Knowledge and Activities for Dengue Problem Solution: An Islamic Religious School, Southern Thailand," *Asian Pacific Journal of Tropical Disease* 2, no. 6 (2012): 456–64, [https://doi.org/10.1016/S2222-1808\(12\)60100-5](https://doi.org/10.1016/S2222-1808(12)60100-5).

¹⁸ Q Y Zaqiah et al., "The Impact of In-Service Teacher Education Program on Competency Improvement Among Islamic Religious Education Teachers Using Self-Assessment," *Education Sciences* 14, no. 11 (2024), <https://doi.org/10.3390/educsci14111257>.

usually involves complex and multidimensional learning indicators that are difficult to capture by conventional tests.¹⁹ If IRE continues to assess students primarily through memorisation, written exams or normative comprehension, it risks missing the actual religious development of students who have different communication styles, cognitive abilities, sensory needs and emotional responses than mainstream learners.²⁰

The distribution of publications across journals such as special needs education, education sciences, sustainability, frontier educational studies and medical education demonstrates that the field is characterized by multiple disciplinary traditions. This interdisciplinary character is both strength and problem.²¹ This is a strength because adaptive learning assessment requires input from pedagogy, psychology, health sciences, assistive technology, curriculum studies and social policy. However, it is also a challenge, as conceptual dispersion can result in disjointed models that are difficult to translate to classroom practice. This means that for IRE, adaptive evaluation cannot be developed by borrowing only general frameworks of inclusive education. It needs to be reconstructed through integrative lenses, which merge inclusive pedagogy and Islamic educational values such as justice, compassion, human dignity, responsibility and recognition of individual capacity. Without such integration, adaptive evaluation in IRE may be technically inclusive, but philosophically divorced from the ethical foundations of Islamic education.²²

The country and affiliation patterns also show that the research productivity is geographically diverse with strong contributions from countries such as United States, Indonesia, United Kingdom as well as institutions from Europe, Asia, Africa and North America. Indonesia's prominent position is of particular significance, as it demonstrates the potential for Muslim-majority contexts to contribute more significantly to global scholarship on inclusive learning evaluation. But high publication is no substitute for theoretical leadership.²³ A key question is whether scholars from countries with a Muslim majority are simply participating in global conversations or whether they are actively contributing to the conceptual language of adaptive evaluation from within their own educational, cultural, and religious contexts. Considering IRE, future scholarship should consider applying existing models from the general education field, and developing context-sensitive frameworks that take into account the distinctive

¹⁹ S Rahmah, K J Vargheese, and E A Dayusman, "Transforming Islamic Education: The Role of Islamic Religious Education (IRE) Teacher Leaders in Designing Learning Materials at Lhokseumawe Junior High Schools," *Jurnal Pendidikan Agama Islam* 22, no. 2 (2025): 544–66, <https://doi.org/10.14421/s3hj4z47>.

²⁰ A Saepudin et al., "Strengthening Character Education: An Action Research in Forming Religious Moderation in Islamic Education," *International Journal of Learning, Teaching and Educational Research* 22, no. 12 (2023): 84–105, <https://doi.org/10.26803/ijlter.22.12.5>.

²¹ A A Rekan et al., "Arabic Language Curriculum as a Foundation for Strengthening Religious Education in Public Higher Education," *Jurnal Pendidikan Agama Islam* 22, no. 1 (2025): 97–121, <https://doi.org/10.14421/jpai.v22i1.11340>.

²² M Yunus Abu Bakar, E Firmansyah, and M B Abdeljelil, "Legal Framework Analysis of Islamic Religious Education Policy Implementation," *International Journal of Law and Society* 3, no. 3 (2024): 217–37, <https://doi.org/10.59683/ijls.v3i3.143>.

²³ Neneng, Diana, and Tias, "Teacher Information Literacy for Inclusive Early Childhood Education (ECE) to Provide Literacy and Numeracy for Special Needs Children in Central Java-Indonesia."

nature of religious learning, the diversity of students with special needs, and the ethical commitments inherent in Islamic pedagogy.²⁴

Thematic map and keyword co-occurrence network illustrate that terms such as inclusive education, students, special needs, learning, and program evaluation are located in central positions within the intellectual structure of the field.²⁵ This suggests a shift in the literature towards a more humanistic and inclusive perspective on educational evaluation. However, the presence of broad indexing terms such as human and humans also calls for cautious interpretation, as keyword centrality does not necessarily reflect theoretical sophistication. A theme may seem dominant because it is frequently indexed rather than deeply conceptualized. This is an important caveat for IRE research. Islamic educational scholars should not adopt dominant bibliometric themes, but reinterpret them critically. The question is not just how students with special needs are assessed, but what constitutes meaningful religious learning, who decides successful religious development, and how can assessment enhance rather than detract from the dignity of diverse learners.²⁶

Emerging and under-developed technologies such as machine learning, virtual reality and digital learning environments point to a major future direction. The capacity to gather and analyze personalized learning evidence is becoming increasingly important in adaptive learning assessment. Digital tools may assist in this process through learning analytics, assistive technologies, alternative communication systems, and personalized feedback mechanisms.²⁷ But technology should not be romanticised as a magic bullet for inclusion. In the IRE, digital assessment tools should be evaluated for accessibility, ethical use of learner data, teacher preparedness, cost-effectiveness, and their capacity to measure spiritual, affective, and behavioral aspects of religious learning.²⁸ A technologically sophisticated assessment system could be pedagogically unsound if it reduces religious development to nothing more than measurable indicators. Technology in IRE should therefore be a useful tool, not a replacement for teacher judgment, dialogic engagement and morally sensitive evaluation.²⁹

Results show that adaptive learning evaluation in IRE should be a multidimensional and differentiated process. Evaluation should be flexible and include oral responses, visual aids, simplified texts, assistive communication and performance-based tasks to assess students understanding of Islamic concepts at the cognitive level. At the affective and spiritual levels, evaluation should take into account students' engagement with values such as gratitude, patience, empathy, honesty and respect,

²⁴ Udasromo et al., "Student Perceptions towards the Implementation of Higher Education's Character Education Program: Challenges and the Role of the Academic Environment."

²⁵ Widyaningsih et al., "Physical Education Learning Design with Augmented Reality for Special Needs Students."

²⁶ Elaldi, Çifçi, and Yerliyurt, "A Meta-Analytical Evaluation of the Effectiveness of Inclusive Practices on Learning Outcomes."

²⁷ E Brzdęk and J Brzdęk, "The Warnke Method for the Diagnosis and Improvement of Phonological Competence in Special Needs Children," *Education Sciences* 10, no. 5 (2020), <https://doi.org/10.3390/educsci10050127>.

²⁸ Amien et al., "Unveiling the Post-Pandemic Pedagogical Shift: A Bibliometric Odyssey into Educational Technology Research on the Scopus Database (2020-2023)."

²⁹ Al Mubarak et al., "Tracing the Progression of Motivated Learning Strategies: An In-Depth Bibliometric Analysis."

but it should also recognize that this engagement may look different for students with different needs. At the practical level, evaluation might involve guided participation in worship-related activities, ethical behaviour, classroom interaction and daily religious habits, modified to the capacity of each learner.³⁰ On the social level, evaluation should consider how students participate in inclusive religious learning communities. This model reorients IRE assessment from a deficit-based to a capability-focused model, where progress, participation and meaningful engagement are key indicators of learning.³¹

Methodologically this study needs to be carefully located. It is important to note that the bibliometric dataset was built upon learning evaluation and special needs and not Islamic Religious Education as a search boundary, so the results should be interpreted as a broader bibliometric mapping which will generate implications for IRE not as a direct representation of the IRE literature.³² This is not a weakness in the method, but the reason why the supplementary search reported in the Methodology section was necessary. The search does confirm that the link between IRE and special-needs evaluation is not completely absent from Scopus, but it is a thin one: the directly relevant studies identified are located outside the evaluation-focused literature mapped in this review, and no evaluation model specific to religious learning is developed. The area is thus better described as underdeveloped than as a mere gap. The contribution of this study, therefore, is to translate global bibliometric trends into a critical research agenda for IRE. To show exactly where the existing IRE-specific literature falls short: At description and values integration, before evaluation design. Future work needs to move beyond general discussions of inclusion by developing empirical, classroom-based and theologically informed models for evaluating adaptive learning that will help students with special needs to find Islamic Religious Education accessible, humane, spiritually meaningful and pedagogically just.

E. Conclusion

The research on adaptive learning evaluation for students with special needs has become a more and more important and interdisciplinary field. This is expressed by the increase in publications, the different journal outlets, the wide disciplinary contributions, the patterns of international collaboration, and the centrality of themes such as inclusive education, students, special needs, learning, and program evaluation. Although the bibliometric dataset was constructed using broader keywords related to learning evaluation and special needs rather than Islamic Religious Education as the primary search boundary, the findings provide significant implications for rethinking evaluation practices in Islamic Religious Education. In particular, they argue for the need to go beyond standardized and cognitively-

³⁰ Ahmad and Khasawneh, "Role of Effective Assessment in Motivating Students with Learning Difficulties in Primary Schools from Teachers' Perspectives in Abha."

³¹ P Wulandari, "Preliminary Study on the Development of Infographic-Based Islamic Education Teaching Materials to Improve Soft Skills for High School Students in Surakarta," *Jurnal Pendidikan Agama Islam* 19, no. 1 (2022): 29–40, <https://doi.org/10.14421/jpai.2022.191-03>.

³² W Hidayat and T Ibrahim, "IMPLEMENTING SCIENCE, SOCIAL INTEGRATION IN ISLAMIC EDUCATION LEARNING," *Jurnal Pendidikan Islam* 7, no. 1 (2021): 1–16, <https://doi.org/10.15575/jpi.v7i1.12515>.

oriented assessment toward more adaptive, differentiated and learner-responsive models of evaluation that can recognize students' individual profiles, modes of communication, developmental capacities and different expressions of religious learning.

In the field of Islamic Religious Education, the evaluation of adaptive learning should not only measure students' ability to master religious knowledge, but also take into account the affective, spiritual, behavioral and social aspects of learning, such as good behavior, participation in worship, ethical awareness and inclusive participation in the classroom. This allows the adaptive learning evaluation to be positioned as an important agenda for developing more humane, equitable, and pedagogically just Islamic Religious Education for students with special needs. However, the bibliometric scope of this review limits its ability to directly examine classroom practices or test a particular evaluation model. Future research should create empirically based, classroom-based, and theologically grounded models of adaptive learning evaluation in Islamic Religious Education, with particular focus on the assessment literacy of teachers, inclusive curriculum design, collaboration with special education professionals, and the ethical application of technologies such as learning analytics, artificial intelligence, and machine learning to facilitate personalized and meaningful feedback.

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