

TRENDS OF DIAGNOSTIC ASSESSMENT IN EDUCATIONAL EVALUATION AND ASSESSMENT JOURNALS IN INDONESIA

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Abstract

Diagnostic assessment is important in evaluating learning to identify students' readiness, learning difficulties, and conceptual errors to maintain the quality of education. This study aims to analyze research trends on the theme of diagnostic assessment in Indonesian journals on educational evaluation and assessment during the period 2014 to 2024. This research employs a systematic review of articles published in educational evaluation and assessment journals indexed in SINTA. The results of this systematic review indicate that the primary focus of research in this field is the development and validation of diagnostic instruments, with a predominance of quantitative approaches and research and development methods. Research subjects primarily involve high school students, while studies involving elementary school students or educators remain limited. The use of qualitative and mixed methods is still rare. These findings indicate that there is still room for expanding the approaches and focus of diagnostic assessment research in Indonesia to generate a more comprehensive understanding that can support educational practices that are more responsive to students' needs. This study can serve as an initial reference for the development of future research and practices in diagnostic assessment.

Keywords: *Diagnostic assessment; Education Evaluation; Literature Review; Education Assessment.*

Abstrak

Penilaian diagnostik merupakan jenis komponen penting dalam melakukan evaluasi pembelajaran dalam hal identifikasi kesiapan, kesulitan belajar dan kesalahan konsep siswa untuk menjaga mutu pembelajaran. Studi ini bertujuan untuk menganalisis tren penelitian dengan tema penilaian diagnostik pada jurnal evaluasi dan penilaian pendidikan di Indonesia selama periode 2014 hingga 2024. Penelitian ini menggunakan tinjauan sistematis pada artikel yang dipublikasikan di jurnal evaluasi dan penilaian pendidikan yang memiliki indeks SINTA. Hasil tinjauan sistematis ini menunjukkan bahwa fokus utama penelitian dalam bidang ini adalah pengembangan dan validasi instrumen diagnostik, dengan dominasi pendekatan kuantitatif dan metode research and development. Subjek penelitian banyak

melibatkan siswa SMA, sementara masih terbatas penelitian dengan subyek siswa SD ataupun pendidik. Penggunaan metode kualitatif dan metode campuran masih jarang digunakan. Temuan ini menunjukkan masih ada ruang perluasan pendekatan dan fokus penelitian penilaian diagnostik di Indonesia untuk menghasilkan pemahaman yang lebih komprehensif yang dapat mendukung praktik pendidikan yang lebih responsif terhadap kebutuhan siswa. Studi ini dapat digunakan rujukan awal untuk pengembangan riset dan dan praktik penilaian diagnostik di masa depan.

Kata Kunci: *Penilaian Diagnostik; Evaluasi Pendidikan; Studi Literatur; Instrumen Penilaian.*

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A. Introduction

Formative assessment in its diagnostic function has become a significant concern in the context of modern education due to its ability to identify both students' weaknesses and strengths early and comprehensively. In learning contexts, this type of assessment is not merely used to evaluate learning outcomes but also functions as an instrument for mapping learning readiness and supporting appropriate interventions to improve learning achievements (Andrade et al., 2019; Irons & Elkington, 2021). In the Indonesian context, practices and studies related to assessment have increasingly found their place in line with a paradigm shift from purely summative assessment toward formative assessment aimed at improving learning processes (Mardapi, 2017).

Diagnostic assessment is conducted before the learning process begins, with the primary purpose of identifying students' learning readiness, conceptual errors or misconceptions, as well as their strengths and weaknesses regarding the material to be studied (Nitko & Brookhart, 2014). This assessment is not intended for final grading but serves as the basis for designing adaptive and responsive learning tailored to students' needs. Therefore, this type of assessment can take the form of tests, interviews, observations, or other instruments capable of mapping students' initial ability profiles before instruction begins (Andersson & Palm, 2018; Boström & Palm, 2020; Poulou et al., 2023).

Diagnostic assessment offers advantages through its capacity to identify students' learning potential and obstacles (Tang & Zhan, 2021; Van der Kleij et al., 2015). Through such assessment, educators can implement differentiated instruction (Nur Budiono & Hatip, 2023; Wulandari et al., 2023). In the context of education both in Indonesia and globally, diagnostic assessment is also highly

relevant to efforts for addressing learning loss in the aftermath of the pandemic, which has demanded adaptation to online learning modalities. The greatest challenges involve the availability of diverse, valid, and reliable instruments, teachers' capacity to conduct assessments and analyze results, and the integration of assessment outcomes into instructional practice (Firmanzah & Sudiby, 2021; Manili et al., 2021; Radino et al., 2021).

Although the urgency and benefits of diagnostic assessment are widely recognized, several previous studies indicate that its implementation and scholarly discussion in Indonesia still face various conceptual and methodological challenges. Research conducted by Aprilla and Fitriani (2024) shows that the development of diagnostic tools often encounters obstacles such as limited developer competencies, inadequate infrastructure, data analysis constraints, and ethical considerations. Meanwhile, Nugroho et al. (2023) emphasize teachers' hesitancy to conduct diagnostic assessments due to limited knowledge regarding its implementation, particularly under the Merdeka Curriculum framework.

To date, research on diagnostic assessment in Indonesia has predominantly focused on instrument development (Ekawati et al., 2024; Eliaumra et al., 2022; Hadi et al., 2015), experimental studies (Aralbaeva et al., 2024; Helman et al., 2023; Intang et al., 2023), and surveys (Imaduddin et al., 2023; Leng & Meng, 2023; Nusantara et al., 2024). Meanwhile, literature studies on published articles, such as those conducted by Nugroho et al. (2023) and Aprilla and Fitriani (2024), have not yet mapped and analyzed research trends in diagnostic assessment within educational evaluation and assessment journals in Indonesia. At a time when formative assessment and evaluation have become central topics, there is a need for bibliometric or meta-analytic reviews of existing research.

Using content analysis of educational evaluation and assessment journals published between 2014 and 2024, this study aims to gather information regarding various studies discussing diagnostic assessment in Indonesia. In detail, this research seeks to answer questions related to the following aspects: (1) What are the trends in the number of studies on diagnostic assessment over the years? (2) What variations in research designs are used to examine diagnostic assessment? (3) What topics are most frequently explored in diagnostic assessment research? (4) What instruments are used by researchers in diagnostic assessment studies? and (5) What techniques are employed in diagnostic assessment research?

This study differs from previous research on diagnostic assessment in several aspects. First, it specifically focuses on analyzing articles published in educational evaluation and assessment journals indexed in the Science and Technology Index (SINTA) from 2014 to 2024. Second, the research concentrates on reviewing articles

that explicitly identify diagnostic assessment as a keyword. Third, various parameters are used as the basis for content analysis.

This research is intended to contribute scholarly insights, particularly in the field of educational evaluation and assessment, with a specific focus on diagnostic assessment. Explicitly, this study maps the focus, methods, subjects, instruments, and analytical techniques used in prior research, thereby establishing a foundation for assessing the direction of development and identifying research gaps that remain open in the field of diagnostic assessment. The findings of this study can also serve as a basis for researchers, educators, and policymakers in designing more varied, practical, and contextual future studies, as well as promoting the use of diagnostic assessment as an integral part of the learning process.

B. Research Methods

Table 1. Aspects and Categories of Content Analysis in the Study

Aspects	Categories	
Type of Research	A.1 Research and Development (R&D) A.2 Classroom Action Research (CAR) A.3 Qualitative A.4 Observational Study A.5 Quasi-Experiment	A.6 Survey A.7 Correlational A.8 Experiment A.9 Ex-Post Facto A.10 Others
Research Subjects	B.1 Elementary School Students B.2 Junior High School Students B.3 Senior High School Students	B.4 University Students B.5 Educators B.6 Lecturers B.7 Others
Data Collection Instruments	C.1 Questionnaire C.2 Test C.3 Observation	C.4 Interview C.5 Documentation C.6 Others
Data Analysis Methods	D.1 Descriptive D.2 Comparative D.3 Correlational	D.4 Regression D.5 Factorial D.6 Instrument Validation D.7 Qualitative D.8 Others

This study is based on the principles of content analysis, focusing on findings from studies published in scientific journals in Indonesia. The research approach is adapted from the work of Fauzi & Pradipta (2018). Data were collected through content analysis of articles published in journals specializing in educational evaluation and assessment. All journals analyzed are indexed in SINTA, ranging from

ranks 1 to 4 as of the year 2024. SINTA (<https://sinta.kemdikbud.go.id/>) is a scientific and technological indexing platform developed by the Indonesian government. A total of eight journals focused on educational evaluation and assessment are indexed in SINTA. The articles analyzed in this study are publications drawn from these eight journals. Thirty-two articles were selected from among hundreds of published articles, specifically those that included the keywords “diagnostic,” “diagnostic assessment,” “penilaian diagnostik,” or their equivalents. All selected articles were analyzed in this study.

The instrument used in this research is a content analysis guide, consisting of aspects presented in Table 1. This instrument was adapted from Fauzi & Pradipta (2018). Data analysis was conducted by classifying each article into specific categories based on the predetermined aspects and categories. The decision to assign articles to particular categories was based on information published by the researchers in sections such as the abstract, methodology, research results, and discussion. Finally, the presentation of data was summarized in the form of diagrams.

C. Results and Discussions

Research Development

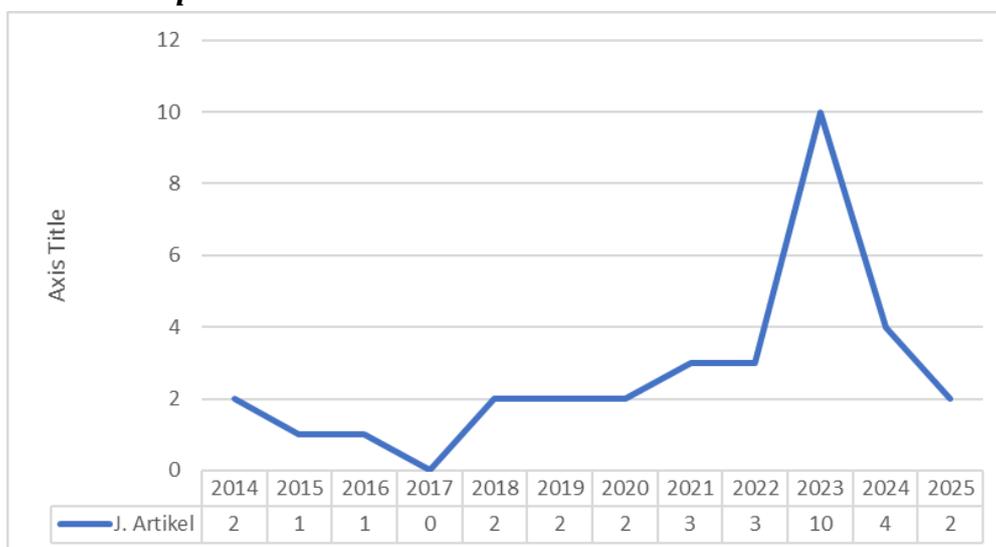


Figure 1. Trends in the Number of Studies on the Theme of Educational Assessment in Educational Evaluation and Assessment Journals

Referring to the graph in Figure 1, the number of published articles over the past ten years focusing on diagnostic assessment as the main subject of study experienced a significant increase in 2023. Meanwhile, the upward trend in the

number of publications only began in 2020, with relatively stagnant numbers in the preceding years. This reflects that diagnostic assessment had not yet become a primary focus in academic discourse during that earlier period. The limited understanding among education practitioners regarding the urgency of formative assessment, as well as the transition in national education policy, may have contributed to this phenomenon (Adek Cerah Kurnia Azis & Siti Khodijah Lubis, 2023; Ardianti & Amalia, 2022; Azis & Lubis, 2023).

The growing trend of researchers' interest in 2020, peaking in 2023, was very likely driven by the effects of the COVID-19 pandemic and the subsequent recovery context. There was significant concern about learning loss as a consequence of the changes in learning approaches during the COVID-19 pandemic. Such concerns were directed at the impact on students' learning progress. A systematic review conducted by Donnelly & Patrinos (2022) found that although there were a few studies claiming that no learning loss occurred due to the pandemic, the majority reported the existence of learning loss affecting some or even most students. Meanwhile, studies in Indonesia have found learning loss manifested in lower learning achievements as well as deficiencies in soft skills, marked by difficulties in understanding learning materials, lack of self-confidence, and challenges in completing learning tasks (Suyadi et al., 2023). On the other hand, the declining trend in the past two years indicates a shift in the context of diagnostic assessment toward other topics, such as digital-based assessment (Indriani et al., 2023; Maronta et al., 2023; Nisaa' Nasution et al., 2023), as well as simultaneous, integrated, and comprehensive implementation of both diagnostic and summative assessment (Budiono & Hatip, 2023; Cannavaro et al., 2024).

Types of Research

The dominance of research and development (R&D) approaches reflects that the primary focus of researchers in Indonesia regarding diagnostic assessment still centers on the development and validation of instruments. This is in line with the paradigm emphasizing the need for diagnostic instruments that possess high validity and reliability (Mardapi, 2017), while also maintaining practicality and effectiveness in identifying students' initial abilities (Lovendra & Aisiah, 2023; Nitko & Brookhart, 2014). Survey methods are also quite dominantly employed by researchers to identify perceptions, understanding, and practices of teachers in conducting diagnostic assessments. For instance, a study by Istiyono et al. (2023) specifically explored students' readiness to use computer-based assessments.

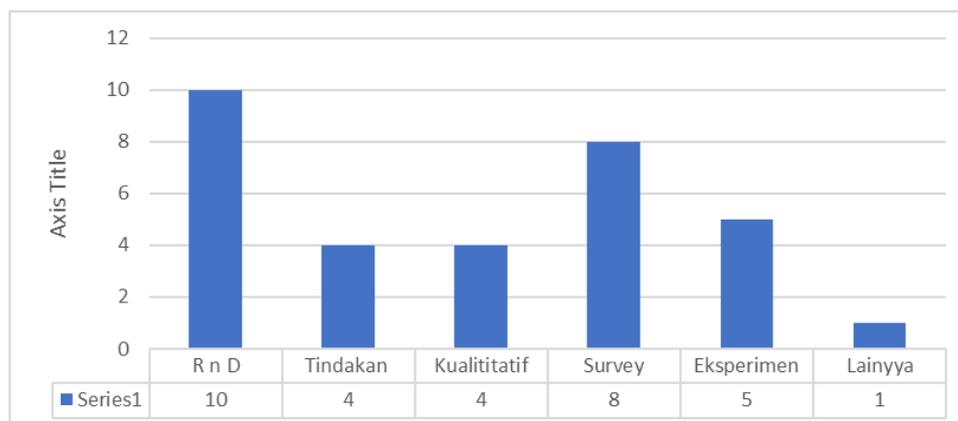


Figure 2. Trends in the Number of Studies Based on Research Types

Experimental and action research methods indicate that some researchers have begun shifting toward examining the effectiveness of diagnostic assessments in mitigating misconceptions in learning and improving learning outcomes. Studies using these methods also combine diagnostic assessment with innovations in strategies, approaches, or instructional models, such as the study conducted by Glushanytsia et al. (2024), which tested a foreign language training model for prospective aviation technicians.

Meanwhile, although still relatively few, qualitative research methods and literature reviews have started to be chosen by researchers. These methods provide deeper exploration into the use of diagnostic assessment in learning processes (Saldana, 2023). The case study approach in educational contexts can be utilized to investigate classroom assessment practices (Yin, 2018). Such studies have proven crucial in developing classroom-based formative assessment in several countries (Ba et al., 2023; Fox-Turnbull, 2024; Grant & Kajee, 2023; Kakar & Kaukab, 2024).

Research Subjects

The research subjects trending in diagnostic assessment studies within educational evaluation and assessment journals are predominantly high school students. This is understandable because, at this stage, students face increasing academic pressure and more complex learning materials, especially in subjects like mathematics and science. Consequently, the need to identify learning readiness, difficulties, and misconceptions becomes higher, and the potential for conducting such identification is greater (Ba et al., 2023; Fox-Turnbull, 2024). Research by Ristanto et al. (2023) shows that diagnostic assessment in high school students is effective in identifying misconceptions in abstract topics within biology.

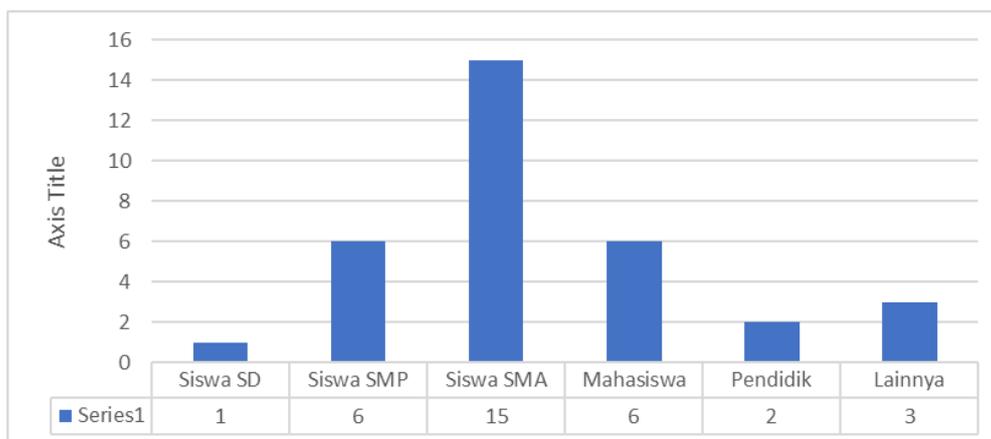


Figure 3. Trends in the Number of Studies Based on Research Subjects

The low number of studies conducted with elementary school students indicates that research on diagnostic assessment at the early stages of students' learning development remains very limited. Ideally, the process of identifying learning difficulties or conceptual errors from an early stage could minimize more severe learning loss in subsequent educational phases (McConnell & Rahn, 2016). In another context, teachers represent a critical factor in the assessment process; thus, teachers' understanding of the functions, implementation, and follow-up actions in diagnostic assessment is crucial in teaching and learning (van der Linden et al., 2023). Studies focusing on other specific subjects, such as students with special needs or teachers in instructional training programs, can serve as initial efforts to develop more contextual and equitable diagnostic assessments.

Research Topics

The dominant topics in diagnostic assessment research still revolve around the development and validation of instruments and focus on the diagnostic function in learning to identify learning readiness, conceptual errors, learning difficulties, or other diagnostic processes. Only one literature review study on diagnostic assessment was found, conducted by Kuswanto et al. (2023). A detailed distribution of studies based on research topics can be seen in Table 2.

Table 2. Distribusi Artikel berdasarkan Topik Penelitian.

Topik	Author	Jumlah
Pengembangan Instrumen	Ristanto et al. (2023), Astuti et al. (2023), Ebiati (2021), Iriyadi (2021), Duskri et al. (2014), Hadi et al. (2015), Prihatni et al. (2016), Khasanah et al., (2020), Eliaumra et al. (2022)	10
Validasi Instrumen	Jumadi et al. (2023), Junpeng et al., (2020), Shantika & Istiyono (2019), Istiyono et al. (2023)	4

Miskonsepsi/ kesulitan belajar	Imaduddin et al. (2023), Glushanytsia et al. (2024), Suyanto et al. (2024), Nusantara et al. (2024), Mulyani (2018)	5
Identifikasi kemampuan	Aralbaeva et al. (2024), Cruz et al. (2023), Leng & Meng (2023), Ekawati et al. (2024), Umar (2019), Natasari et al., (2023), Helman et al. (2023), Musyahrafa et al. (2021), Intang et al. (2023), Syahriani et al. (2022), Prawinugraha et al. (2024), Abidin & Retnawati (2019)	12

The dominance of topics still concentrated on the development and validation of diagnostic instruments and their utilization for instructional design and strategies reflects researchers' attention to the urgency of having valid and reliable instruments for the early detection of learning barriers. Studies with such a focus align with Wyse et al. (2023), who assert that diagnostic assessment represents the starting point for effective pedagogical intervention. Moreover, diagnostic assessment instruments specifically designed for particular subjects enable teachers to obtain precise information about students' specific misconceptions (Nitko & Brookhart, 2014).

Meanwhile, there is still room for systematic literature review studies, given the limited number of studies employing this approach. Reviews conducted through comprehensive and integrative knowledge synthesis remain necessary to map the theoretical and methodological development of research in the future and to identify existing research gaps as a foundation for further studies (Booth et al., 2016).

Data Collection Instruments

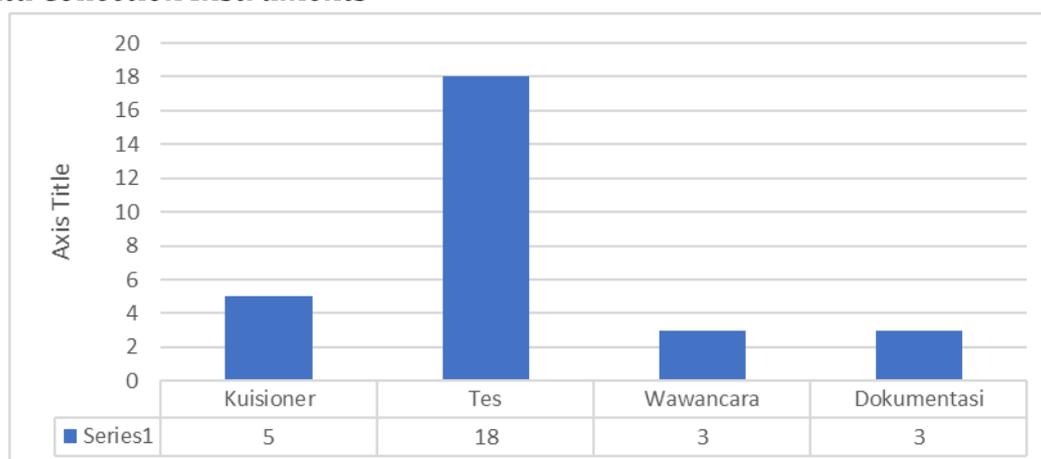


Figure 4. Tren Jumlah Penelitian Berdasarkan Instrumen Pengumpul Data Penelitian

Based on the instruments used in diagnostic assessment studies, the majority of research still relies on test instruments. This indicates that research remains oriented toward quantitative approaches and the measurement of cognitive abilities. Test instruments indeed possess high objectivity levels in assessing students' abilities. Diagnostic test models with two-tier or three-tier designs have been widely used to detect misconceptions (Halim et al., 2020; Juliani et al., 2021). However, this approach predominantly emphasizes outcomes and still has shortcomings for exploring thought processes, learning strategies, or affective factors, which are also essential domains in learning. Qualitative instruments such as observations, interviews, or documentation should ideally complement test-based assessments to optimize the diagnostic assessment process (Creswell & Creswell, 2018).

Data Analysis Methods

The trend in diagnostic assessment research in educational evaluation and assessment journals predominantly focuses on the development and validation of instruments. As a result, most of these studies employ data analysis methods such as reliability and validity testing and item characteristic analysis, which align with measurement and educational evaluation theories (Crocker & Algina, 2008; Mardapi, 2017; Nitko & Brookhart, 2014). This focus indicates that research on the topic of diagnostic assessment is still in its foundational stage. This step is crucial because diagnostic assessment must indeed be built using instruments that are valid, reliable, and suited to students' characteristics and learning objectives (Burns, 2018). However, if the focus on instrument development is not broadened to include analyses of impact testing, effectiveness, or implementation in actual instructional contexts, it may limit the practical applications of the research findings.

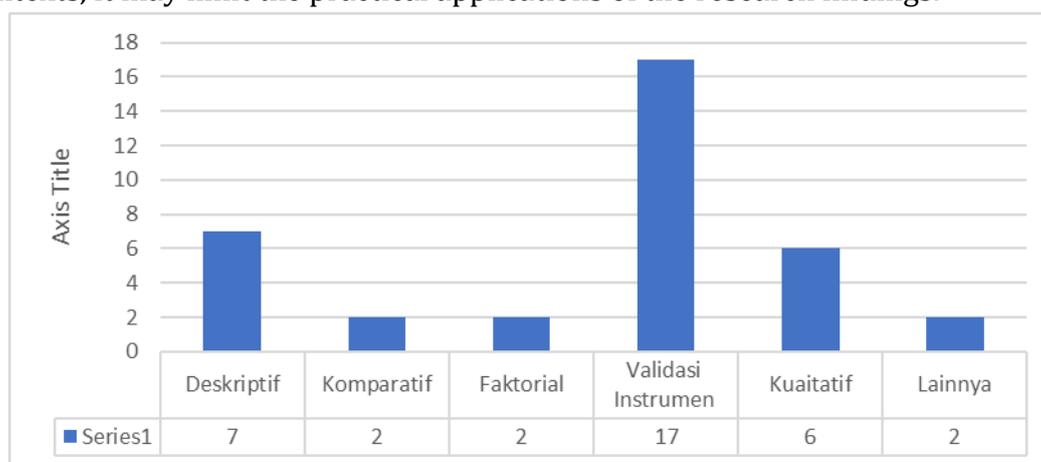


Figure 5. Trends in the Number of Studies Based on Data Analysis Methods

D. Conclusions

In this study, the research trends on diagnostic assessment in educational evaluation and assessment journals in Indonesia over the past decade demonstrate a strong tendency toward the development and validation of instruments, with a predominance of quantitative approaches and the use of tests as the primary data collection instruments. Research subjects remain largely concentrated at the high school student level, while studies involving elementary school students as research subjects are still very rare. This condition creates opportunities for future researchers to broaden the focus of research, both in terms of methodology and the contextual application of diagnostic assessment. Such efforts are essential to contribute meaningfully to the enhancement of comprehensive and equitable quality of learning.

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