

## ANALYSIS OF TRENDS IN THE USE OF DIGITAL-BASED ASSESSMENT INSTRUMENTS: SYSTEMATIC LITERATURE REVIEW (2020-2025)

Khusnul Estining Tyas<sup>1</sup>, Wahyu Lestari<sup>2</sup>, Bambang Subali<sup>3</sup>, and Ellianawati Ellianawati<sup>3</sup>

<sup>1</sup>Elementary Education Study Program, Graduate School, Universitas Negeri Semarang, Indonesia

<sup>2</sup>Research and Evaluation Study Program, Graduate School, Universitas Negeri Semarang, Indonesia

<sup>3</sup>Physics Education Study Program, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang, Indonesia

E-mail: <sup>1</sup>[khusnulestiningtyas\\_2000@students.unnes.ac.id](mailto:khusnulestiningtyas_2000@students.unnes.ac.id)\*

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### ABSTRACT

The advancement of digital technology has brought significant changes in the world of education, including in the implementation of assessments in elementary schools. This study aims to analyze the trend of the use of digital-based assessment instruments at the elementary school level during the period 2020–2025, as well as to identify the challenges and needs for developing innovative and interactive instruments. The method used is a systematic literature review (SLR) by collecting and filtering 1179 articles from Google Scholar and Crossref, with inclusion criteria of only 9 relevant articles. The results of the study showed that the dominance of research was developmental (55.56%), followed by quantitative (22.22%), and no classroom action studies (PTK) were found. The trend shows an increase in the use of digital media such as Quizizz, Wordwall, Google Form, and Kahoot, but there is still a lack of HOTS assessment instruments that are interactive and in accordance with the characteristics of the material, especially in mathematics learning. The main challenges include low innovation in evaluation methods and limited use of digital media. In conclusion, the development of responsive, multimedia, and innovative digital instruments is needed to increase the effectiveness of assessment and student participation, supporting 21st century learning at the elementary level.

**Keywords:** *digital assessmen,; instrument development, elementary school*

### ABSTRAK

Kemajuan teknologi digital telah membawa perubahan signifikan dalam dunia pendidikan, termasuk dalam pelaksanaan penilaian di sekolah dasar. Penelitian ini bertujuan untuk menganalisis tren penggunaan instrumen penilaian berbasis digital di tingkat sekolah dasar selama periode 2020–2025, serta mengidentifikasi tantangan dan kebutuhan pengembangan instrumen yang inovatif dan interaktif. Metode yang digunakan adalah systematic literature review (SLR) dengan mengumpulkan dan menyaring 1179 artikel dari Google Scholar dan Crossref, dengan kriteria inklusi hanya 9-artikel yang relevan. Hasil penelitian menunjukkan bahwa dominasi penelitian bersifat pengembangan (55, 56%), diikuti kuantitatif (22, 22%), dan tidak ditemukan studi tindakan kelas (PTK). Tren menunjukkan peningkatan penggunaan media digital seperti Quizizz, Wordwall, Google Form, dan Kahoot, namun masih terdapat kekurangan instrumen penilaian HOTS yang interaktif dan sesuai karakteristik materi, terutama dalam pembelajaran matematika. Tantangan utama meliputi rendahnya inovasi dalam metode evaluasi dan pemanfaatan media digital yang masih terbatas. Kesimpulan, diperlukan pengembangan instrumen digital yang responsif, multimedia, dan inovatif untuk meningkatkan efektivitas penilaian dan partisipasi siswa, mendukung pembelajaran abad ke-21 di tingkat dasar.

**Kata kunci:** *Penilaian Digital, Pengembangan Instrumen, Sekolah dasar*



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## INTRODUCTION

The progress of a country can be seen from the good or bad education that is implemented. Through education, quality human resources can be produced (Safitri, 2020). An educator has an important role in the world of education. Teachers are required to be more creative and innovative in delivering learning to students, in the learning process of course it cannot be separated from assessment (Firtsanianta & Khofifah, 2022). Assessment can be used to make a decision based on measurement. The measurement uses a set of instruments based on predetermined objectives (Hariono et al., 2021). Therefore, assessment must be carried out properly and correctly in order to obtain the right information for decision-making and improvement in the learning process.

Current technological developments encourage the preparation and implementation of technology-based assessments (Gani *et al.*, 2024). Assessment using technology moves processes that were previously carried out conventionally using paper to methods that utilize technological tools such as computers (Farman *et al.*, 2021). This aims to overcome the ineffectiveness of conventional assessment methods. This condition is characterized by the existence of application-based exams. Application-based exams allow convenience and bring innovation in accessing information (Setiawati *et al.*, 2023). Currently, application-based tests are implemented in the learning process by creating assessment instruments with the help of computers, websites, and multimedia. The use of technology in assessment is a suitable solution to assess students' abilities and to impact students' attention and motivation in their activities (Adi Saputra et al., 2021).

One of the steps taken by the government is to provide students with a number of subjects that must be studied. One of the subjects that must be studied is mathematics. Mathematics is a universal field of science and plays an important role in various disciplines and in the development of human thinking capacity (Yusron Abda'u Ansya et al., 2024, p. 175). Mathematics has a role in solving real-life problems and creating active students (Biassari et al., 2021). Progress in mathematics teaching at the elementary school level can be measured by how well students understand the material being taught (Widiarti et al., 2021). This can be seen from the results of the assessment carried out by educators.

The current condition is that teachers still use conventional assessments, namely by using paper. In evaluating learning at the elementary school level, teachers generally still rely on paper-based tests (PBT) which use printed questions and manual assessments, so that the assessment process takes a long time, is prone to student dishonesty, and requires costs to print the questions (Ratna Widya Wijayanti et al., 2023)

With the use of appropriate technology, it can provide convenience for teachers and students (Yulismar & Nuzulia, 2022). In addition, with technology, assessment of learning outcomes will be more objective, transparent and economical (Badrudin *et al.*, 2024). In fact, there are still many teachers who have difficulty in making good assessments by utilizing technology. An educator must be able to follow the development of the times (Setiawan *et al.*, 2024). Some applications that can be used as media and learning evaluation tools are wordwall, quizzz, liveworksheet. These applications can be accessed via the website and are usually used as learning evaluation tools (Fanani *et al.*, 2022). The use of digital assessment instruments in mathematics learning at the elementary school level is based on the need to increase the

effectiveness and efficiency of learning evaluation, provide faster feedback to students, and produce neater and more valid learning data (Tiara et al., 2024). In addition, the use of digital instruments also makes the learning process more in line with technological developments that are close to students' daily lives, helps teachers create an interactive learning atmosphere, and facilitates the implementation of learning that is appropriate to the abilities of each student (Ningrum & Awi, 2023). Thus, digital instruments are the right solution to optimize mathematics learning that is often considered challenging in elementary schools.

Innovative elementary school education that guides students to be active and creative is the first step in improving the quality of education in Indonesia (Hariono *et al.*, 2021). Conditions in the field, there is potential to improve student learning outcomes in mathematics learning, through the development of assessment instruments (Sulistiyorini et al., 2023). The aim of developing assessment instruments is for students to gain new experiences when taking learning outcome tests, so that it is hoped that this can increase students' motivation in participating in classroom learning using technology-based assessment instruments (Rahmawati *et al.*, 2022). Currently, the assessment instruments used by elementary school teachers are generally still conventional, namely using paper (paper-based) and based on Student Worksheets (LKS).

Teachers usually provide written questions in the form of multiple choices, fill-in-the-blanks, or descriptions printed on paper, then corrected manually. This instrument is still limited in terms of flexibility, analysis of learning outcome data, and providing feedback to students which often takes quite a long time (Setiawati et al., 2023). It is hoped that this assessment instrument can develop into a digital-based one to be more effective and efficient. By using digital instruments, teachers can make questions more interactive, check answers automatically, provide faster feedback, and store learning outcome data in a structured manner.

Based on this background, this study will use the Systematic Literature Review (SLR) method by searching and analyzing various journals, articles, and publications related to the use of digital-based assessment instruments in elementary schools. This study aims to analyze the trend of using digital-based assessment instruments in mathematics learning in elementary schools for the period 2020–2025. This study aims to understand the developments, challenges, and opportunities in the development of digital assessment instruments that are innovative, adaptive, and in accordance with today's learning needs. The benefits of this article are to provide a comprehensive overview of the use of technology in assessment at the elementary school level, so that it can be a reference in developing more effective and interesting assessment instruments. In addition, the results of this study can help educators and media developers in designing interactive instruments that are in accordance with the characteristics of the material, especially in mathematics learning, and support digital transformation in elementary education.

## RESEARCH METHODS

In this study, the method used is Systematic Literature Review (SLR). SLR is a structured research method used to collect, critically review, combine, and present the results of various relevant research studies discussing certain questions or topics (Arissona Dia Indah Sari *et al.*, 2023). The focus of the Systematic Literature Review lies in identifying the theories or definitions

to be found, aiming to integrate various definitions into one more accurate definition (Ritterbusch & Teichmann, 2023).

Data collection in this study was through the Google Scholar and Crossref databases. In this study, documents related to the use of digital-based assessment instruments were analyzed, which were obtained using the Publish or Perish (PoP) application and analyzed using the PRISMA method. Data collection comes from journal articles with the keywords "Digital assessment instruments" or "Technology-based assessment" or "Learning evaluation trends" or "Digital transformation of education" in the Google Scholar and Crossref databases through the PoP application. The selected variables are:

Tabel 1. *Research Question*

ID	Research Question	Objective
RQ 1	How many articles per year?	To find out the annual publication trends in the field of digital-based assessment instrument studies.
RQ 2	The author has most cited articles?	To identify the most influential articles based on the number of citations.
RQ 3	Analyze the problems that occur?	To analyze issues or problems that often arise in research related to digital-based assessment instruments.
RQ 4	What types of research are frequently conducted?	To classify the types of research approaches most frequently used in these studies.
RQ 5	What topics are frequently researched?	To reveal the dominant topics that are the focus of research in the field of digital-based assessment instruments.

Next, the researcher then extracted the frequency of each variable. Using inclusion and exclusion criteria, the inclusion criteria include 1) topics that discuss the use or development of digital-based assessment instruments, 2) the context of elementary school education in mathematics, 3) articles written in English or Indonesian. While the exclusion criteria are: 1) topics that discuss non-digital assessments or do not use assessment instruments, 2) non-educational contexts, 3) articles in languages other than English or Indonesian. To map trends in this area, the index is analyzed quantitatively and qualitatively.

The stages of conducting a Systematic Literature Review in this study are as follows:

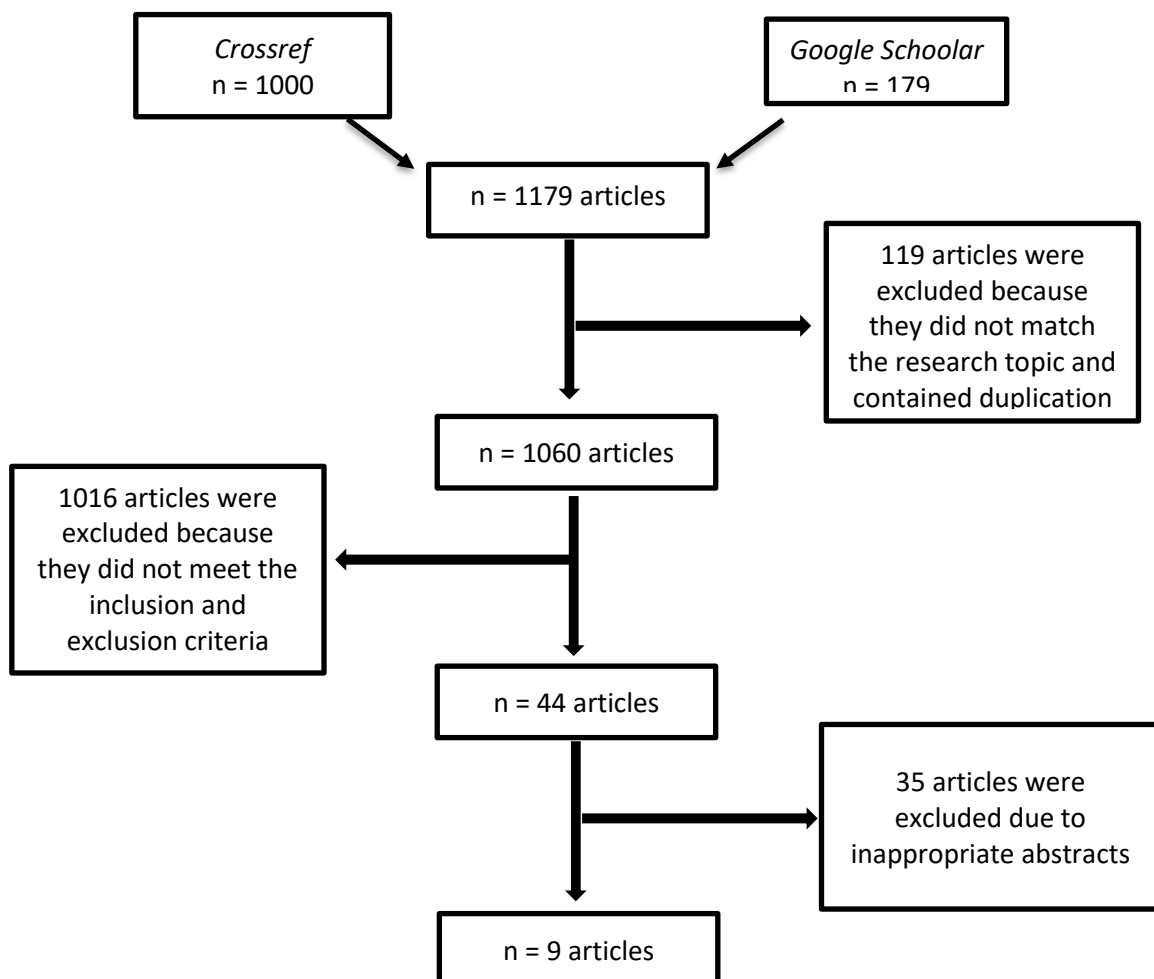
1. The first stage is identification, at this stage; researchers collect references or literature relevant to the research topic and previously determined keywords through the Google Scholar and Crossref databases. In this study, the researcher uses the keywords Digital assessment instruments, Technology-based assessments, Learning evaluation trends, Digital transformation of education.
2. The second stage is selection, at this stage selecting and grouping literature/references in the form of articles that are appropriate and can be used in research. The criteria for journals that can be used are research journals that discuss digital-based assessment instruments containing mathematics indexed by SINTA 1 to 6.

3. The third stage is verification, at this stage the researcher examines the article to analyze and assess its suitability based on the criteria that have been set.
4. The fourth stage is combination and conclusion, this stage is the final stage, namely the stage where the literature enters into synthesis or the stage where the results are compared with existing theories.

## RESULTS AND DISCUSSION

### Research Result

In a scientific study, especially one based on literature studies or systematic reviews, the data collection and selection process is a crucial stage to ensure the validity and relevance of the research results. Article selection is carried out in a structured manner through several stages, starting from the initial search in various databases, filtering based on topic suitability, to the application of inclusion and exclusion criteria. This process aims to obtain articles that are truly in accordance with the focus and objectives of the research, and to avoid bias due to irrelevant or duplicate data. These selection stages are then visualized in the form of a flowchart to illustrate the number of articles retained or eliminated at each screening stage (Gambar 1).



Picture 1. Data Collection Flow

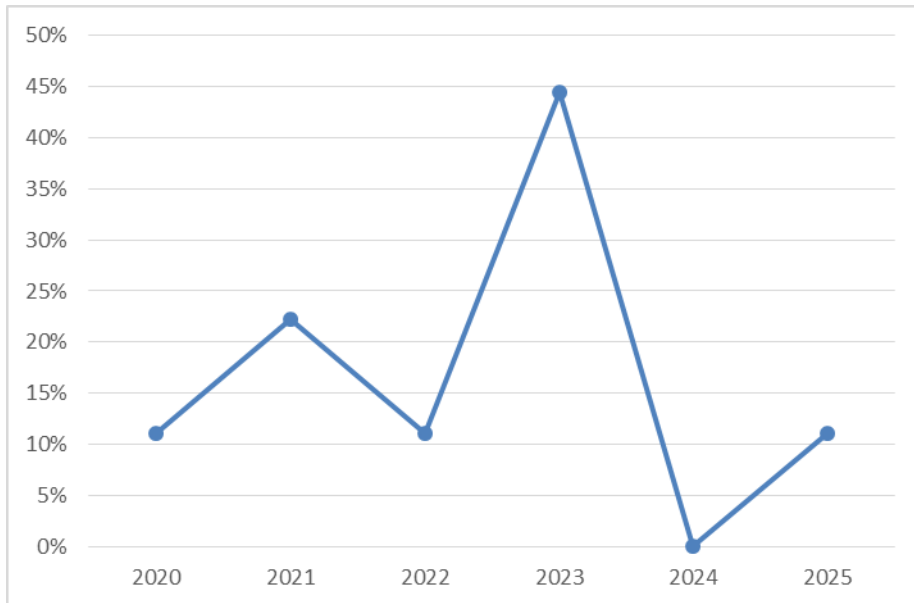
Picture 1 shows the data collection flow carried out through a systematic review process of scientific articles. Initial data were obtained from two databases, namely Crossref as many as 1,000 articles and Google Scholar as many as 179 articles, so that 1,179 articles were collected. In the initial screening stage, 119 articles were excluded because they did not match the research topic and there were duplications, leaving 1,060 articles. Furthermore, a selection was carried out based on inclusion and exclusion criteria, which resulted in 1,016 articles being eliminated because they did not meet these criteria. Of the remaining 44 articles, 35 articles were again eliminated because their abstracts did not match. Finally, only 9 articles met all the criteria and were used as data sources in this study. This process shows a strict and systematic selection approach to ensure the relevance and quality of the articles analyzed.

The results of this study indicate an increasing trend in the use of digital-based assessment instruments in elementary education environments. Based on the data obtained, it can be seen that the number of publications examining this topic has increased every year, accompanied by variations in the number of citations reflecting the high attention to the development of digital assessment tools. Analysis of the challenges faced in practice also revealed that the limitations of interactive instruments that are in accordance with the characteristics of the teaching materials are the main obstacles, emphasizing the importance of digital media to increase student participation. These findings indicate that the direction of research in the field of developing digital assessment instruments continues to progress, in line with the flow of digital transformation in the world of education that demands innovation in this research. This process shows a strict and systematic selection approach to ensure the relevance and quality of the articles analyzed.

### ***Discussion***

This study aims to analyze the trend of using digital-based assessment instruments in the period 2020 to 2025 through the Systematic Literature Review (SLR) approach. Specifically, the purpose of this study is to compile a map of research trends related to digital assessment instruments to provide an overview of the direction of future research. By mapping these trends, it is hoped that topics that have been widely researched and areas that are still under-explored can be identified, so that they can be a reference for further researchers in developing more in-depth studies that are relevant to the needs of education in the digital era.

The following figure is presented to answer question RQ1. The data illustrates the trend of digital assessment instruments for mathematics subjects in elementary school learning. Based on the search results, 9 articles were obtained that were in accordance with the theme of this study. The articles selected and considered relevant to this study consisted of articles published in 2020 totaling 1 article, 2 in 2021 totaling 2, 1 in 2022 totaling 1 article, 4 in 2023 totaling 4 articles, and 1 in 2025 totaling 1 article.



Picture 2. Presentation of Many Articles 2020-2025

Picture 2 shows the percentage of articles per year that illustrate the trend of publication of articles related to the topic over the past six years. In 2020 and 2021, there was an increase in interest in the use of digital assessment instruments with percentages of 11.11% and 22.22%, respectively. However, in 2022, no relevant articles were found, indicating a decrease or possible limited publication. The peak of attention to this topic occurred in 2023 with the highest percentage of 44.44%, which was likely influenced by the acceleration of digital transformation in education after the pandemic. In 2024, no relevant articles were found again, but in 2025 articles began to appear again with a percentage of 11.11%. These data show that the research trend on digital assessment instruments is fluctuating, but shows a significant increase at certain points, especially in 2023, which can be the focus in analyzing this trend.

The following is to answer the research question RQ2 presented in the table, presenting 9 articles with the number of citations:

Tabel 2. Data Ecstasy Results

No.	Author Name	Year	Title	Journal	Citation
1	Adnin Rizki Kasdina, Fitri Siti Sundari, Rukmini Handayani	2023	Pengembangan Instrumen Penilaian Berbasis Hots Berbantuan <i>Website Wordwall</i> Pada Materi Bangun Ruang	Didaktik : Jurnal Ilmiah PGSD STKIP Subang	5
2	Dian Fitri Nur Aini, Nawang Sulistyani	2020	Pengembangan Instrumen Penilaian E-Quiz ( <i>Electronic Quiz</i> ) Matematika Berbasis Hots ( <i>Higher Of Order Thinking Skills</i> ) Untuk Kelas V Sekolah Dasar	Widyagogik : Jurnal Pendidikan dan Pembelajaran Sekolah Dasar	10
3	Ernawati, Muhammad	2023	Pemanfaatan <i>Quizizz</i> sebagai Media Penilaian Peserta Didik	Jurnal Teknologi Pendidikan: Jurnal Penelitian	10

No.	Author Name	Year	Title	Journal	Citation
	Nurwahidin, Dwi Yulianti			dan Pengembangan Pembelajaran	
4	Fitri Yeni, Wahyu Kurniawati	2022	Efektivitas Penggunaan Aplikasi <i>Quizizz</i> Untuk Penilaian Pembelajaran	Primary: Jurnal Pendidikan Guru Sekolah Dasar	9
5	Ida Muza, Kirotul Umah, Indhira Asih Vivi Yandari, Zerry Rahman Hakim	2023	Pengembangan Evaluasi Berbasis Digital Melalui <i>Web Wordwall</i> Pada Peserta Didik Kelas V Sekolah Dasar	Jurnal Pendidikan Dasar Perkhasa: Jurnal Penelitian Pendidikan Dasar	6
6	Iwan Hariono, Iskandar Wiryokusumo, Achmad Noor Fathirul	2021	Pengembangan Instrumen Penilaian Kognitif Berbasis <i>Google Form</i> Pelajaran Matematika	Edcomtech:Jurnal Kajian Teknologi Pendidikan	29
7	Khatmirul Aziz, Heru Siddik Nugroho	2025	Efektifitas Instrumen Penilaian Volume Kubus Dan Balok Dalam Pembelajaran Matematika Sd Berbasis Macromedia Flash dalam Evaluasi Pembelajaran Volume Kubus dan Balok di Kelas V SDN Depok 01	WASPADA (Jurnal Wawasan Pengembangan Pendidikan	0
8	Mushthofiyah Mushthofiyah	2021	Implementasi Instrumen Penilaian Berbasis <i>Macromedia Flash</i> dalam Evaluasi Pembelajaran Volume Kubus dan Balok di Kelas V SDN Depok 01	Jurnal Riset Pendidikan Dasar (JRPD)	0
9	Ni Nyoman Gita Suariantini, Basilius Redan Werang, I Gede Astawan	2023	Instrumen Asesmen Numerasi Online Menggunakan Aplikasi <i>Kahoot</i> Pada Mata Pelajaran Matematika Kelas IV Sekolah Dasar	<i>Innovative: Journal Of Social Science Research</i>	3

Based on citation data from the nine articles examined in this study, there were a total of 72 citations that were unevenly distributed in each article. The article with the highest number of citations was the work of Iwan Hariono and his colleagues published in 2021 (Hariono et al., 2021), entitled "Pengembangan Instrumen Penilaian Kognitif Berbasis *Google Form* Pelajaran Matematika", with a total of 29 citations. This article shows significant influence in the field of digital assessment instrument development in elementary education environments. Two other articles that also have a relatively high number of citations, namely 10 citations each, are the works of (Nur Aini & Sulistyani, 2020) dan (Ernawati et al., 2023), which discusses the use of HOTS-based e-quiz and the use of Quizizz as an assessment medium. Several other articles have



moderate to low citations, such as the work of Fitri Yeni et al. (2022) with 9 citations, (Kirotul Umah et al., 2023) with 6 citations, (Kasdina et al., 2023) with 5 citations, and (Suariantini et al., 2023) with 3 citations. Meanwhile, two articles have no citations at all, namely Mushthofiyah (2021) and Khatmirul Aziz et al. (2025), possibly due to the recent publication time or lack of exposure among other researchers. This finding shows that although articles in 2023 dominate in terms of quantity, articles in 2021 are superior in terms of academic influence. This confirms that the quality, relevance, and distribution of articles play an important role in determining the citation rate, not just the year or number of publications.

The following table 3 is an explanation of the research question RQ3 regarding the analysis of the problems raised from each article title reviewed from the perspective of needs or gaps in learning assessment practices in elementary schools, as follows:

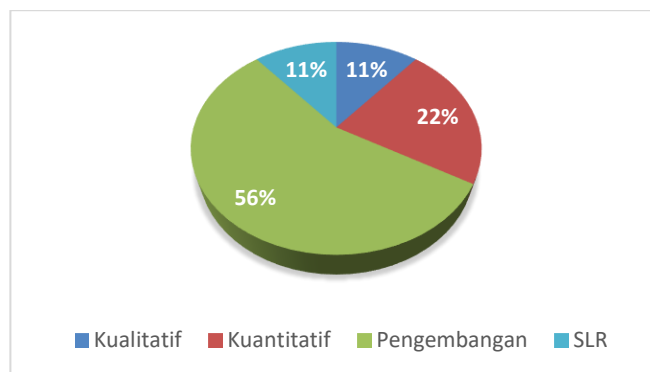
Tabel. 4 Problem Analysis

No.	Author Name	Problem Analysis
1	Adnin Rizki Kasdina, Fitri Siti Sundari, Rukmini Handayani	Lack of interactive Higher Order Thinking Skills (HOTS) based assessment instruments that are in accordance with the characteristics of geometry materials, especially spatial figures. Teachers need digital media such as Wordwall to increase engagement and evaluation quality.
2	Dian Fitri Nur Aini, Nawang Sulistyani	Limitations in mathematics assessments that are able to measure high-level thinking skills (HOTS) in grade V. There is a need for electronic assessment instruments that are appropriate to the digital era and emphasize in-depth understanding.
3	Ernawati, Muhammad Nurwahidin, Dwi Yulianti	Lack of innovation in evaluation methods that are interesting and adaptive to technological developments. Media such as Quizizz are needed to increase student motivation and participation in the assessment process.
4	Fitri Yeni, Wahyu Kurniawati	Empirical evaluation of the effectiveness of using digital applications such as Quizizz in the context of learning assessment is needed. Teachers need to know whether this application really has a positive impact on learning outcomes.
5	Ida Muza Kirotul Umah, Indhira Asih Vivi Yandari, Zerry Rahman Hakim	The minimal use of Wordwall technology in the evaluation process at the elementary school level. It is necessary to develop digital assessment instruments that are easy to use and can be adjusted to the needs of fifth grade students.
6	Iwan Hariono, Iskandar Wiryokusumo, Achmad Noor Fathirul	The use of Google Form as a structured cognitive evaluation tool in mathematics lessons is not yet optimal. Practical, efficient instruments are needed that are able to measure students' cognitive domains accurately.
7	Khatmirul Aziz, Heru Siddik Nugroho	Lack of visual and interactive evaluation instruments that help students understand the concept of volume

No.	Author Name	Problem Analysis
8	Mushtofiyah Mushtofiyah	of geometric shapes. A multimedia approach is needed to support concrete learning. Challenges in implementing Flash-based technology for volume material evaluation, including integration into classroom learning. It is important to know how this technology can be implemented effectively.
9	Ni Nyoman Gita Suariantini, Basilius Redan Werang, I Gede Astawan	<i>Low use of game-based applications such as Kahoot in numeracy assessments. It is necessary to develop online instruments that are fun but still valid in measuring basic math skills.</i>

Based on the analysis of the titles of the articles reviewed, it can be concluded that the main problems raised in these studies revolve around the need for innovation in learning assessment instruments in elementary schools, especially through the use of digital technology. The prominent problems include the limited assessment instruments that are able to measure high-level thinking skills (HOTS), the low use of interactive media such as Wordwall, Quizizz, Google Form, and Kahoot, and the lack of effectiveness of conventional instruments in adapting to today's learning needs. In addition, several studies highlight the importance of developing visual or multimedia content-based instruments, especially in mathematics learning such as the volume of geometric shapes, to help students understand how to integrate technology into assessments so that the evaluation process becomes more efficient, interesting, and relevant to the demands of 21st century education.

Figure 3 is an explanation of research question RQ5 regarding the types of research commonly used in articles on trends in the use of digital-based assessment instruments.

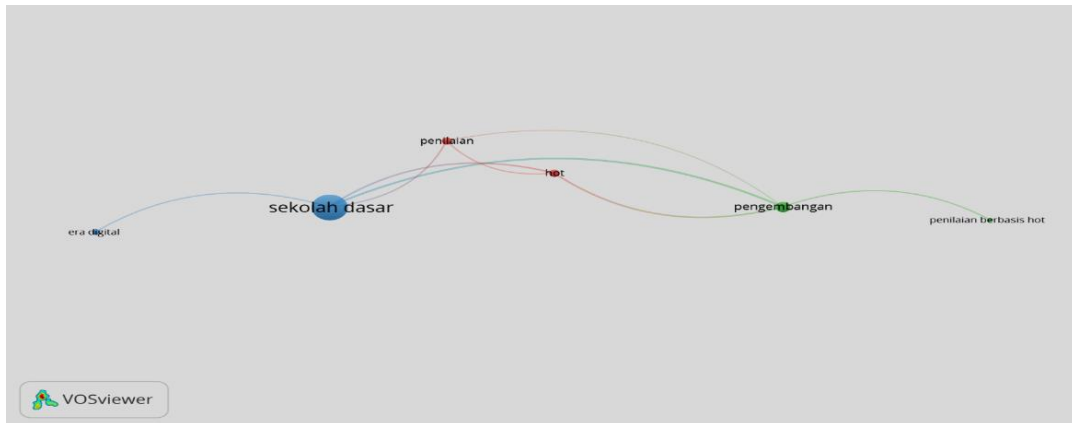


Picture 3. Presentase Jenis Penelitian

Based on the results of the analysis of articles reviewed in the study of Trends in the Use of Digital-Based Assessment Instruments, it is known that the most dominant type of research is development research, which covers 56% of all articles. This shows that most of the research during that period focused on the design and development of digital-based assessment instruments or media. Furthermore, quantitative research is in second place with a percentage of 22%, indicating that there is quite a lot of interest in numerical or statistical approaches in studying digital instruments. Meanwhile, 11% of articles each use qualitative and systematic

literature review (SLR) approaches, including this article itself. No articles were found using the Classroom Action Research (CAR) approach, indicating that this approach has not been the main focus in research on digital assessment instruments during the 2020–2025 period. This finding provides an illustration that development research still dominates the trend and opens up opportunities for other approaches to be explored further in the future..

The density of frequently appearing topics related to this research topic in the last 5 years, namely in the 2020-2025 period, is visualized by the results of the VOSviewer analysis (Gambar 4).



Picture 4. VOSviewer view for keyword based analysis

In the visualization, the keyword "elementary school" is the main center with the largest node size, indicating that this term appears most often and has a strong relationship with other keywords. This term is directly connected to the words "assessment", "digital era", "hot" (possibly referring to Higher Order Thinking), and "development". This shows that the studies in this study discuss a lot about the development of assessment instruments applied in elementary schools in a digital context.

The keyword "development" forms its own cluster and is closely connected to the phrase "HOT-based assessment", indicating that the focus of development is largely directed at creating instruments capable of measuring high-level thinking skills. Meanwhile, the word "hot" also acts as a link between "assessment", "development", and "elementary school", reinforcing the finding that HOT assessment is one of the main themes in the research trends analyzed

The relationship between the words "digital era" and "elementary school" also indicates that changes and developments in technology are an important background in the development of assessment instruments. Overall, this visualization reflects that research in the 2020–2025 period focuses on the development of HOTS assessment instruments at the elementary school level that are relevant to the demands of the digital era.

## CONCLUSION

Based on a systematic review of literature published between 2020 and 2025, it can be concluded that the trend of using digital-based assessment instruments in elementary school learning has experienced significant development, both in terms of the number of publications and the diversity of platforms used. The studies analyzed show that the use of technology such as Quizizz, Wordwall, Google Form, Kahoot, and Macromedia Flash is increasingly popular as an alternative or complement to conventional assessment instruments. The trend of using technology in assessment is growing and shows great potential to increase the effectiveness, objectivity, and attractiveness of the learning evaluation process. This study aims to understand how technological innovations, such as multimedia media and digital platforms, are integrated into assessments, and to identify the challenges and opportunities that exist.

The results show that although the adoption of technology is increasing, it is still necessary to develop instruments that are more interactive, visual, and in accordance with the characteristics of the material, especially in mathematics learning. In the future, research will focus on the development and testing of more innovative and adaptive digital assessment instruments, as well as evaluating their effectiveness in improving student learning outcomes at the elementary level. In general, this study emphasizes the importance of technological innovation in learning evaluation to improve the quality and effectiveness of assessment at the elementary school level, and highlights the challenges and opportunities in developing digital instruments that meet modern needs.

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