**Jurnal Teknologi Pendidikan:**
***Jurnal Penelitian dan Pengembangan Pembelajaran***
https://e-journal.undikma.ac.id/index.php/jtp/index

*Oktober 2026 Vol. 11 No. 4*
*E-ISSN: 2656-1417*
*P-ISSN: 2503-0602*
*pp. 675-696*

# The Use of KIPIN Paper to Online (PTO) for Offline Digital Assessment and Data Informed Instructional Decision Making: A Multiple Case Study in Public Junior High Schools in North Konawe Regency

**Muchlis*, Titi Fatmawati, Lilianti, Abu Bakar**
Muhammadiyah University of Kendari
***Corresponding Author e-mail: muchlizovic@gmail.com**

**Abstract:** This qualitative multiple case study examined KIPIN Paper to Online (PTO) as a digital assessment medium in two public junior high schools in North Konawe, Indonesia. The study focused on planning, implementation, dashboard analytics, and assessment follow-up. Ten purposively selected informants included two principals, two vice principals for curriculum, four subject teachers, and two operators. Interviews, observations, and documents were analyzed through data condensation, display, verification, and cross-case comparison. At SMP Negeri 1 Motui, approximately three years of experience supported more autonomous interpretation and use of assessment results; teachers reported revisiting topics, adapting instruction, and providing enrichment. At SMP Negeri Satap 7 Oheo, initial implementation relied heavily on operator assistance, and several instructional adjustments remained planned rather than verified as completed. In both cases, assessments operated on a local network without external internet, and results were recorded automatically. Device readiness, user accounts, electricity, and technical competencies remained constraints. The findings distinguish the availability of analytics from teachers' autonomous pedagogical use of data; the design does not establish causal improvements in learning outcomes.

**Article History**
Received: 09-09-2026
Revised: 30-10-2026
Published: 31-10-2026

**Key Words :**
KIPIN PTO; digital assessment; dashboard analytics; teacher behavior; learning assessment.

**How to Cite**: Muchlis, M., Fatmawati, T., Lilianti, & Bakar, A. (2026). The Use of KIPIN Paper to Online (PTO) for Offline Digital Assessment and Data Informed Instructional Decision Making: A Multiple Case Study in Public Junior High Schools in North Konawe Regency. *Jurnal Teknologi Pendidikan : Jurnal Penelitian Dan Pengembangan Pembelajaran*, *11*(4), 675–696. https://doi.org/10.33394/jtp.v11i4.22520

https://doi.org/10.33394/jtp.v11i4.22520

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## Introduction

The rapid development of information and communication technology (ICT) in the twenty-first century has brought significant changes to various aspects of life, including education (Rahimi & Oh, 2024). Digital transformation in education is no longer merely an option but has become an imperative that educational institutions must address. This perspective is consistent with the findings of previous studies indicating that advances in information technology have substantially transformed the educational ecosystem, particularly in the development of digital learning systems and technology-enabled educational management (Wijaya et al., 2025); (Destiana et al., 2025).

The digitalization of learning provides substantial opportunities to create teaching and learning processes that are more effective, efficient, and responsive to learners' needs. The integration of ICT into instructional practices has been associated with enhanced learning

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effectiveness, increased learner participation, and the provision of real-time feedback during the learning process (Mahabul et al., 2025; Ulfah et al., 2025). One important component of education that has undergone substantial digital transformation is learning assessment. In digitally mediated learning environments, assessment is increasingly moving beyond conventional paper-based practices toward technology-supported approaches that enable greater flexibility, faster processing, and stronger integration with learning systems (Zamista, 2022).

Assessment is an integral component of the educational process. Within the context of the *Kurikulum Merdeka* (Independent Curriculum) implemented by the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia, assessment is designed to capture learning achievement holistically across cognitive, affective, and psychomotor domains. This shift in the assessment paradigm requires teachers to employ diverse and contemporary assessment instruments, including those supported by digital technologies. Digital assessment responds to this demand by reducing reliance on paper-based instruments and utilizing technological devices that facilitate more practical, accurate, and efficient assessment processes (Tiwow et al., 2025).

One educational technology platform developed to support the digitalization of assessment in Indonesia is KIPIN PTO (Kios Pintar *Paper to Online*). KIPIN PTO is designed to digitalize practice exercises, tryouts, daily assessments, and school examinations by transforming conventional paper-based activities into digitally administered assessments. A distinctive feature of KIPIN PTO is its capacity to operate without continuous internet connectivity. This functionality makes the platform particularly relevant for schools located in areas with limited or unreliable internet infrastructure. In addition, KIPIN PTO provides an analytical dashboard that automatically records assessment results, enabling teachers to analyze learner performance data and use the resulting information to support more targeted instructional decision-making (Susianto, 2021).

The relevance of using a local network is evident in two public junior high schools in North Konawe Regency, where access to external internet connectivity is limited, as indicated by informants' accounts and implementation records. Under these conditions, internet-based digital assessments may face challenges related to network connectivity and data quota availability. KIPIN PTO utilizes a local server and Wi-Fi network to administer assessments without requiring external internet access. However, its operation still depends on electricity, appropriate devices, and operational support. This study does not provide statistical data on internet network coverage at the regency level; consequently, the description of connectivity conditions is limited to the specific contexts of the two research sites.

Although both schools use the same platform, they differ in their levels of implementation experience. SMP Negeri 1 Motui has been using KIPIN PTO for approximately three years, whereas SMP Negeri Satap 7 Oheo is still in the early stages of implementation, including its use for summative assessments in June 2026. These differences in experience provide a basis for comparing teachers' autonomy, the distribution of responsibilities among system operators, and the translation of assessment results into instructional practices. The statements regarding teachers' practices presented in this introduction serve as contextual information that is further examined and substantiated in the findings section, rather than as evidence of the system's causal effects.

These differences in implementation experience shift the focus of the study beyond whether assessments can be conducted offline to examining how pedagogical, technical, and

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institutional readiness interact with teachers' ability to interpret assessment results. A central concern of this study is the distinction between the availability of analytical reports and their actual use in instructional decision-making, particularly when system operators continue to manage most aspects of technical access.

To situate this issue within the existing literature, several previous studies have examined KIPIN, learning analytics, and offline assessment applications. Susianto (2021) concluded that the use of KIPIN PTO had a positive impact on student satisfaction. Another study by Muhammad et al. (2024) demonstrated that the use of the Kipin School digital platform could improve literacy skills, although challenges related to user adaptation remained. Furthermore, Ashari et al. (2023) revealed that the implementation of application-based electronic assessment requires both technical and pedagogical readiness among teachers. Kharis and Zili (2022) further emphasized that learning analytics utilizing digital footprint data has proven effective in supporting evidence-based decision-making in education, including more in-depth analyses of students' learning behaviors. Additionally, Vasquez-Cevallos et al. (2025) developed an Android-based cognitive assessment application capable of operating offline in riverside areas with limited infrastructure. Their study demonstrated that offline functionality enables assessments to be conducted effectively while facilitating teachers' monitoring of students' learning progress through automatically generated reports.

Overall, these previous studies have highlighted the ease of use of assessment technologies, teachers' readiness, and the potential of learning analytics. However, the existing literature on KIPIN PTO has not adequately addressed comparisons of practices between two schools with different levels of implementation experience, particularly regarding how assessment reports are interpreted, communicated to teachers, and used to inform follow-up instructional actions. The research gap addressed in this study is empirical and contextual in nature, rather than implying that no similar studies have previously been conducted.

Building on this empirical research gap, the contribution of this study lies in its cross-case comparison of the relationships among assessment instrument planning, offline assessment implementation, access to dashboard analytics, and teachers' post-assessment instructional decisions. Differences in the levels of autonomy between the two schools provide an opportunity to distinguish between the system's capacity to generate assessment information and the ability of teachers and school organizations to utilize that information effectively. This study does not measure improvements in learning outcomes or examine the causal effects of KIPIN PTO.

In line with this contribution, the study aims to describe the planning and implementation of digital assessments, examine the use of analytical information to interpret assessment results and inform follow-up instructional actions, and compare the challenges and support mechanisms across the two schools. The findings are expected to provide a practical foundation for strengthening digital assessment practices in educational settings with limited internet infrastructure.

## Research Method

This study employs a qualitative approach to gain an in-depth understanding of the implementation of KIPIN PTO as a digital assessment tool in teaching and learning, drawing on the experiences, perceptions, and practices of subject teachers at public junior high

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schools in North Konawe Regency. The qualitative approach enables the researcher to develop a comprehensive understanding of the phenomenon through direct interaction with informants in their natural settings, without manipulating existing conditions.

A multiple-case study design was employed, treating SMP Negeri 1 Motui and SMP Negeri Satap 7 Oheo as two distinct cases analyzed separately using the same four research focuses. After identifying patterns within each case based on interviews, observations, and documentation, the findings were compared to identify similarities, differences, and context-specific explanations supported by empirical evidence. This comparison was interpretive in nature rather than intended to establish causal relationships.

The study was conducted at SMP Negeri 1 Motui and SMP Negeri Satap 7 Oheo in North Konawe Regency, Indonesia. Both schools were purposively selected because they had implemented KIPIN PTO and had experience administering assessments through local networks. Field data included observations of summative assessments conducted in June 2026 and interviews carried out in August 2026. Differences in the duration of system use, approximately three years at SMP Negeri 1 Motui and one year at SMP Negeri Satap 7 Oheo, as reported in the informant profiles, provided a basis for comparing the two cases. Information regarding internet connectivity was derived from informants' accounts and school documents rather than quantitative measurements of network quality

Informants were selected based on their experience and direct involvement in administering assessments using KIPIN PTO (Table 1). The selection process employed purposive sampling, a technique in which informants are chosen based on specific criteria aligned with the research objectives. This technique was adopted because not all members of the school community had experience using KIPIN PTO as a digital assessment tool.

The ten informants comprised five individuals from each school. At SMP Negeri 1 Motui, the informants included the principal (AM), the vice principal for curriculum affairs (AP), two subject teachers (IN and NW), and a KIPIN PTO operator (SA). At SMP Negeri Satap 7 Oheo, the informants consisted of the principal (RU), the vice principal for curriculum affairs (HH), two subject teachers (EA and RK), and a KIPIN PTO operator (YY). The inclusion of these different roles enabled cross-checking of information related to school policies, pedagogical practices, and technical administration. The number of informants was reported based on the available data, without assuming that theoretical saturation had been achieved in the absence of documented evidence.

**Table 1. Research Informants**

| No. | Informant Category | Inclusion Criteria | Number |
|---|---|---|---|
| 1 | School Principals | Serving as school principals at the time of the study; knowledgeable about policies related to the implementation of KIPIN PTO; involved in decision-making concerning digital assessment; and willing to provide relevant information for the study. | 2 |
| 2 | Vice Principals for Curriculum | Serving as vice principals responsible for curriculum; knowledgeable about the planning and implementation of assessment practices at the school; involved in coordinating the use of KIPIN PTO; and willing to participate as research | 2 |

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| | | | |
|---|---|---|---|
| | | informants. | |
| 3 | Subject Teachers | Serving as subject teachers at public junior high schools in North Konawe Regency; having experience using KIPIN PTO for learning assessment; involved in assessment planning, implementation, analysis of assessment results, and follow-up activities; and willing to provide in-depth information. | 4 |
| 4 | School Operators or KIPIN PTO Coordinators | Responsible for managing or supporting the use of KIPIN PTO; knowledgeable about application and device configuration; experienced in supporting the implementation of digital assessment; and familiar with technical challenges and their resolution. | 2 |
| | Total | | 10 |

Based on the research objectives and multiple-case study design, the scope of analysis was organized into four common research focuses across both schools. This study focuses on the implementation of KIPIN PTO as a digital assessment tool in teaching and learning practices among subject teachers at public junior high schools in North Konawe Regency. The four main focuses encompass assessment planning using KIPIN PTO, assessment implementation using KIPIN PTO, analysis of assessment results through the KIPIN PTO dashboard and its influence on teachers' instructional practices, and evaluation and follow-up actions based on assessment results. These four aspects were selected because they represent interconnected stages of digital assessment implementation and align with the research questions established in this study.

Data were collected through semi-structured interviews with ten informants, non-participant observations of summative assessment activities at each school, and reviews of teaching, learning, and assessment documents. The data collection guidelines were developed based on the four research focuses. To examine the consistency of the findings, the researcher compared informants' accounts with observational records and documentary evidence. Details that were not documented in the raw field data were not reconstructed.

Specifically, interviews at SMP Negeri 1 Motui were conducted on August 20–21, 2026, while interviews at SMP Negeri Satap 7 Oheo were conducted within the date range recorded in the informant records. The interview questions covered the development of assessment blueprints, system configuration, assessment implementation, interpretation of item analysis results, remedial instruction, enrichment activities, and technical challenges. Statements concerning planned follow-up actions were distinguished from reports of activities that had already been implemented and the corresponding observational evidence.

To verify the practices reported during the interviews, documented observations included summative assessment activities conducted at SMP Negeri 1 Motui on June 8 and 10, 2026, as well as assessment activities at SMP Negeri Satap 7 Oheo. The observation sheets employed three categories: observed, not observed, and not observable. These records

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were used to examine who uploaded assessment questions, activated assessment schedules, monitored the dashboard, addressed technical issues, and planned follow-up instructional actions.

To complement these two data collection techniques, document analysis included teaching modules, assessment blueprints, assessment instruments, question banks, assessment schedules and configurations, dashboard screenshots, score summaries, teachers' analysis records, remedial and enrichment documents, and school evaluation records. The existence of these documents was not automatically treated as evidence that the corresponding activities had been implemented. For example, remedial programs that had only been scheduled were distinguished from activities that had actually been carried out.

In qualitative research, the researcher serves as the primary research instrument. The researcher is involved in all stages of the research process, including designing the study, selecting informants, collecting data, analyzing the findings, and drawing conclusions. Accordingly, the researcher is expected to possess adequate skills in conducting observations and interviews, interpreting data, and maintaining objectivity throughout the research process. In conducting the study, the researcher used several supporting instruments, including an interview guide, observation sheets, a document review guide, an audio recorder, a camera, and field notebooks. These instruments were developed based on the research focuses to facilitate the collection of data relevant to the research objectives.

Data analysis in this study employed the interactive model developed by Miles, Huberman, and Saldaña (2014). The analysis began during data collection and continued until verifiable conclusions were reached. Rather than following a linear sequence, the analytical process involved continuous interaction among data collection, data condensation, data display, and conclusion drawing and verification. This iterative process enabled the researcher to revisit the field data whenever information was incomplete, inconsistent, or required further investigation.

During the data collection stage, the researcher gathered information through interviews, observations, and document analysis. Interviews were conducted to explore the experiences, understanding, practices, challenges, and use of KIPIN PTO among subject teachers and other informants involved in its implementation. Observations were carried out to directly examine how assessments were administered, how devices and networks were used, how teachers supervised assessment activities, and how assessment results were accessed. Document analysis was employed to corroborate the data using relevant materials, including teaching and learning documents, assessment blueprints, assessment instruments, schedules, system configurations, assessment results, and follow-up action records. The collected data were then documented in the form of interview transcripts, field notes, observation sheets, and research documentation. Data collection was conducted concurrently with preliminary analysis, enabling the researcher to promptly identify information that required further clarification, verification, or in-depth exploration.

Following data collection, data condensation was conducted to select and organize the collected information. At this stage, the raw data were systematically selected and organized to identify the information most relevant to the research questions. Data condensation involved five interrelated activities: selecting, focusing, simplifying, abstracting, and transforming. During the selecting stage, the researcher identified interview, observation, and documentary data directly related to the implementation of KIPIN PTO, while information unrelated to the research focuses was excluded from the main analysis. During the focusing

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stage, the selected data were organized according to the four research focuses, ensuring that each piece of information was appropriately positioned within the analytical framework.

As part of data condensation, the simplifying stage (Table 2) involved reducing extensive field data into more concise descriptions without losing their essential meaning or contextual information. Statements conveying identical or closely related meanings were summarized to minimize redundancy and maintain clarity in the analysis.

**Table 2. Results of the Simplifying Process**

| Focus | Field Data | Simplified Data |
|---|---|---|
| Assessment Planning | Teachers aligned the Learning Outcomes (CP) and Learning Objectives (TP) specified in the teaching modules, determined whether the assessment was formative or summative, developed the content, indicators, question formats, and number of items, and subsequently converted the questions into the KIPIN PTO template. | Assessment planning involved aligning assessment objectives and instruments with the Learning Outcomes (CP) and Learning Objectives (TP) before uploading the questions to KIPIN PTO. |
| Technical Planning | Teachers ensured that the questions had been uploaded, checked the server, prepared the required devices, communicated the assessment schedule, and instructed learners to ensure that their devices were sufficiently charged. | Assessment readiness encompassed the preparation of the system, devices, user accounts, schedule, and learners. |
| Assessment Implementation | Learners connected to the local Wi-Fi network, accessed KIPIN PTO through an IP address, logged into the system, completed the questions within the allocated time, and had their scores automatically recorded. | Assessments were administered through a local network using structured access procedures, with results automatically recorded by the system. |
| Monitoring | Teachers directly supervised the classroom while simultaneously monitoring login status, assessment progress, and completion through the *Monitor* menu. | Assessment monitoring was conducted through both physical and digital supervision. |
| Challenges | Challenges included depleted device batteries, forgotten passwords, device configuration problems, and the server's dependence on the electricity supply. | The main challenges concerned user-device readiness and the availability of a reliable electricity supply. |
| Dashboard Analytics | Teachers obtained information on individual scores, class averages, mastery percentages, and item-level analysis. | Dashboard analytics provided information on overall class achievement and difficulties associated with specific assessment items or learning content. |

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| | | |
|---|---|---|
| Teacher Practices | Teachers revisited content that was frequently answered incorrectly and shifted from lecture-based instruction to discussions, visual media, or practical activities. | Assessment information was used to adjust instructional content and teaching strategies. |
| Reflection | Teachers used analytical results to determine whether previous instructional delivery and teaching methods had been effective. | Assessment data served as a basis for reflecting on instructional effectiveness. |
| Evaluation | KIPIN PTO was perceived to reduce paper consumption and accelerate the scoring process, although challenges related to devices and electricity remained. | KIPIN PTO improved assessment efficiency, although its technical effectiveness was influenced by device readiness and electricity availability. |
| Follow-up | Learners whose achievement remained below the Learning Objective Achievement Criteria (KKTP) participated in remedial activities, whereas those who had achieved the expected targets received enrichment activities or higher-order thinking skills (HOTS) questions. | Assessment results served as the basis for determining remedial and enrichment activities. |

Following data simplification, the researcher proceeded to the abstracting stage, which involved identifying the underlying meanings, patterns, trends, and relationships emerging from the data. For example, information related to the development of Learning Outcomes (CP), Learning Objectives (TP), assessment blueprints, test items, schedules, devices, and user accounts was abstracted into broader concepts of pedagogical alignment and technical readiness for digital assessment. The final stage of data condensation was transforming, in which the simplified and abstracted data were converted into codes, categories, and analytical themes. This process enabled the researcher to establish connections among data obtained from different informants and identify patterns emerging within each case.

The third stage was data display. The condensed data were systematically organized to make the relationships among different pieces of information more apparent. Data were presented through analytical narratives, findings matrices, category tables, and thematic groupings based on the four research focuses. At this stage, rather than presenting the raw data in their entirety, the researcher displayed selected and organized information, allowing patterns, relationships, contextual differences, and emerging trends in the findings to be examined more systematically.

The fourth stage involved conclusion drawing and verification. At this stage, the researcher interpreted the patterns, relationships, trends, and meanings emerging from the displayed data. Preliminary conclusions were not immediately regarded as final but were continuously examined through comparisons across data sources, reviews of field notes, checks for consistency among interview, observation, and documentary data, and re-

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examination of evidence considered insufficiently robust. When inconsistencies or inadequate information were identified, the researcher revisited the original data for further verification. Final conclusions were established only after the identified patterns demonstrated consistency and were adequately supported by evidence from multiple data sources.

Overall, the data analysis followed a cyclical process, moving from data collection to data condensation, data display, and conclusion drawing, with repeated examination of the original data whenever necessary. This interactive approach enabled an in-depth analysis of KIPIN PTO implementation, as each finding was not merely collected but also selected, focused, simplified, categorized, displayed, interpreted, and verified. Through this iterative process, the researcher developed a comprehensive understanding of assessment planning, implementation, the use of dashboard analytics, as well as assessment evaluation and follow-up actions.

Data credibility was established by comparing information provided by school principals, vice principals for curriculum affairs, teachers, and system operators with observation sheets and the documents reviewed (source and methodological triangulation). The findings from each school were first analyzed separately and then compared to identify common patterns and contextual differences. Descriptions of the research contexts and informants' roles were provided to facilitate the assessment of transferability. The traceability of research claims was maintained through informant codes and references to document types. Procedures such as member checking, external auditing, or the achievement of data saturation were not claimed unless explicitly documented in the research records. This sequence of data analysis and cross-checking provided the foundation for developing traceable interpretations within each case before conducting a cross-case comparison.

Before data collection, the researcher obtained permission from the respective schools and explained the purpose of using the collected information for academic purposes. Informant codes were used in the presentation of the findings to protect personal identities. The names of the institutions were disclosed because they were necessary to identify the two cases and compare their respective contexts. No claims were made regarding written informed consent or formal ethical review procedures in the absence of supporting documentation.

## Result and Discussion

### *Result*

The analysis of each case began by organizing informants' accounts, observation records, and relevant documents according to the four research focuses. The following presentation examines the patterns identified at each school separately before comparing the findings across the two cases. Direct quotations were retained in accordance with the substance of the informants' responses, while the reported findings were limited to practices documented through informant accounts or direct observations.

Based on these procedures, the four research focuses provided the framework for organizing the data: assessment planning, assessment implementation, the use of dashboard analytics and teachers' responses, and assessment evaluation and follow-up actions. The themes presented in Table 3 represent a synthesis of data from both schools, while variations between the two cases are further elaborated in the findings and the cross-case comparison matrix.

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**Table 3. Thematic Structure of the Analysis**

| Theme | Core Category | Meaning of the Findings |
|---|---|---|
| Digital Assessment Planning Using KIPIN PTO | Pedagogical planning | Assessments were designed based on Learning Outcomes (CP), Learning Objectives (TP), assessment blueprints, and assessment instruments. |
| | Technical readiness | The server, local network, user accounts, devices, and assessment schedules were prepared prior to assessment implementation. |
| | User readiness | Teachers and learners were prepared to use KIPIN PTO for digital assessment. |
| | School support | School principals, curriculum coordinators, teachers, and administrators supported the assessment planning process. |
| Digital Assessment Implementation Using KIPIN PTO | Local network-based implementation | Assessments were administered through a local network without dependence on external internet connectivity. |
| | Assessment management | The system managed access, assessment duration, completion processes, and automatic storage of assessment results. |
| | Assessment monitoring | Teachers conducted direct supervision supported by digital monitoring features. |
| | Technical support | Issues related to devices, user accounts, and network connectivity were addressed with administrative and technical support. |
| Utilization of Dashboard Analytics and Its Influence on Teachers' Instructional Practices | Assessment information | The dashboard provided information on scores, mastery levels, class averages, and item-level analysis. |
| | Interpretation of assessment results | Teachers used assessment data to identify learning achievement and areas of learning difficulty. |
| | Instructional decision-making | Assessment data were used to determine subsequent instructional actions and priorities. |
| | Instructional adjustment and reflection | Teachers adjusted their instructional strategies and reflected on teaching effectiveness based on assessment results. |
| Evaluation and Follow-up of Assessment Results | Implementation evaluation | KIPIN PTO implementation was evaluated in terms of efficiency, technological performance, and user readiness. |
| | Instructional follow-up | Assessment results were used to inform remedial activities, enrichment, and instructional improvement. |
| | Sustainability of implementation | Technological infrastructure and teachers' competencies need to be strengthened to |

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support the sustainable implementation of KIPIN PTO.

**1. Digital Assessment Planning Using KIPIN PTO**

The findings indicate that digital assessment planning using KIPIN PTO begins with pedagogical considerations rather than technological operations. Teachers first establish assessment objectives based on Learning Outcomes (CP) and Learning Objectives (TP), followed by determining the content, indicators, question formats, cognitive levels to be assessed, number of questions, and answer keys. Assessment blueprints and instruments are developed before the questions are uploaded into the system. These findings suggest that digitalizing assessments does not replace the fundamental principles of assessment planning but rather provides a digital platform for administering assessments that have been pedagogically designed. After the pedagogical design had been developed, the planning process proceeded to administrative and technical aspects. The curriculum division was responsible for organizing assessment schedules, establishing minimum achievement criteria, determining the number and formats of assessment questions, and coordinating the use of KIPIN PTO. Technical preparations included activating the local server, checking Wi-Fi connectivity, managing user accounts, uploading assessment questions, configuring assessment schedules, and preparing the devices to be used by students. Students' readiness was also addressed by providing user accounts, appropriate devices, and instructions for accessing and using the system.

During these preparatory activities, the distribution of responsibilities revealed differences between the two cases. At SMP Negeri 1 Motui, teachers IN and NW developed and uploaded assessment instruments with support from the system operator. In contrast, at SMP Negeri Satap 7 Oheo, teachers EA and RK developed assessment blueprints and completed the provided templates, while operator YY was responsible for uploading the assessment materials and managing the technical configurations. These findings were supported by observation records and documentary evidence from both schools, indicating that similar levels of pedagogical readiness did not necessarily correspond to equal levels of autonomy in using digital technology.

These differences in responsibilities were reflected in the informants' accounts. At SMP Negeri 1 Motui, IN explained that assessment objectives were aligned with Learning Outcomes (CP) and Learning Objectives (TP) before developing assessment blueprints, test items, and answer keys (interview, August 20, 2026). At SMP Negeri Satap 7 Oheo, EA stated, "I only fill in the test items in the Word template provided by the administrator, and then I submit the completed template back to the administrator for uploading into the application" (interview, informant EA). This comparison highlights the distinction between teachers' competence in developing assessment instruments and their technical control over the digital platform.

**2. Digital Assessment Implementation Using KIPIN PTO**

The implementation of assessments using KIPIN PTO was conducted through the schools' local networks. The process involved activating the assessment, connecting devices to the local Wi-Fi network, accessing the system through an IP address, logging in with individual user accounts, completing the assessment within the allocated time, supervising the assessment process, and automatically saving the results upon completion. A key finding at the implementation stage was KIPIN PTO's ability to operate without relying on an external internet connection. By utilizing a local server and network, the system enabled

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assessments to be administered even in settings with limited internet access. This feature represents one of the main advantages of KIPIN PTO, particularly in regions facing connectivity challenges.

During these stages, observations at SMP Negeri 1 Motui showed that teachers prepared assessment instruments and accessed the results, whereas at SMP Negeri Satap 7 Oheo, assessment schedule activation and technical monitoring were carried out by the system operator. The observation records from Oheo classified assessment activation and technical assistance by teachers as "not observed," as these activities were performed by the operator. This difference in responsibilities is important to ensure that the smooth implementation of assessments is not misinterpreted as evidence of equivalent levels of technical competence among teachers at the two schools.

Once the procedures for accessing the system and completing the assessment had begun, assessment supervision was carried out through two mechanisms: direct supervision in the assessment room and digital monitoring through the system. Teachers continued to play an essential role in maintaining order, ensuring that students followed the established procedures, and providing guidance throughout the assessment process. At the same time, students' progress could be monitored through the features available in KIPIN PTO. This pattern indicates that digitalization does not eliminate the role of teachers but rather expands the mechanisms available for supervising assessments.

In addition to assessment supervision, implementation challenges were primarily related to device battery life, user account and login errors, and dependence on a reliable electricity supply. At SMP Negeri 1 Motui, backup laptops and technical assistance from the system operator were provided when students encountered device-related problems. At SMP Negeri Satap 7 Oheo, the operator played a more dominant role in activating assessment schedules, monitoring the dashboard, and resolving access-related issues, as documented in the observation records. The absence of disruptions related to external internet connectivity during assessments did not necessarily mean that the risks associated with power outages had been adequately addressed.

These findings indicate that the successful implementation of KIPIN PTO depends on the integration of several interconnected components, including the local server, Wi-Fi network, devices, user accounts, assessment configurations, students' readiness, teachers' competencies, and administrative support. Although KIPIN PTO reduces dependence on external internet connectivity, it still requires a stable electricity supply and adequately prepared devices as essential supporting infrastructure.

**3. Utilization of Dashboard Analytics and Changes in Teachers' Instructional Practices**

The findings indicate that the function of KIPIN PTO extends beyond assessment administration and score reporting. Upon completion of an assessment, the system generates information, including individual scores, class averages, mastery percentages, detailed score breakdowns, and item analysis results. This information is used to identify learning content that students have not yet mastered and to gain a more detailed understanding of their learning achievement.

Informants' accounts revealed differences in follow-up instructional actions between the two cases. IN reported that low scores on the "Enzymes" subtopic prompted a review of the material, while NW described adjustments to the teaching of "Explanation Texts" after identifying frequent errors related to cause-and-effect structures. In contrast, EA stated, "I plan to provide additional word-problem exercises using more contextual examples, although this is still only an intention" (informant EA). Similarly, RK indicated that the proposed

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group discussions remained at the initial planning stage. These findings reveal varying degrees of progression from interpreting assessment reports to planning or reporting instructional actions, rather than providing quantitative evidence of effectiveness.

Based on these accounts, the use of dashboard analytics can be understood as an instructional decision-making process, with varying levels of implementation across the two cases. Teachers initially examine assessment data, identify items frequently answered incorrectly, relate these items to specific learning content or competencies, and subsequently determine appropriate instructional actions. Content areas showing low levels of mastery provide a basis for revisiting material, reinforcing understanding, or adjusting instructional strategies.

At the practical level, teachers' responses to analytical information differed according to their implementation experience. At SMP Negeri 1 Motui, IN reported revisiting the enzymes subtopic and adjusting instructional methods for content areas in which students had demonstrated low achievement. NW described reinforcing students' understanding of cause-and-effect structures in explanation texts through text analysis activities. In contrast, at SMP Negeri Satap 7 Oheo, EA identified difficulties with fraction word problems, while RK identified weaknesses in students' understanding of norms. However, both teachers indicated that their subsequent instructional adjustments were still in the planning stage. These accounts demonstrate the use of assessment information to inform instructional decision-making rather than providing evidence that all planned actions had been implemented.

Based on this comparison, the analytical process of utilizing assessment information can be illustrated as follows (the action and reflection stages were not consistently verified across both cases):

Assessment results → analytical information → data examination → identification of learning achievements and difficulties → teacher interpretation → instructional decision-making → instructional strategy adjustment → reflection.

This process of data utilization does not occur automatically. At SMP Negeri 1 Motui, teachers reported practices involving the interpretation of assessment results and subsequent instructional adjustments. In contrast, at SMP Negeri Satap 7 Oheo, analytical information was still largely explained or communicated by the system operator. Observation records from Oheo also documented plans to revisit learning materials as follow-up actions rather than observed improvements in learning outcomes. These differences highlight the importance of distinguishing between the availability of dashboard analytics, teachers' ability to interpret assessment data, and instructional actions that have actually been implemented.

**4. Evaluation and Follow-up of Assessment Results**

Following the examination of assessment planning, implementation, and dashboard utilization, the evaluation of KIPIN PTO implementation revealed two dimensions: the effectiveness of digital assessment technology and the use of assessment results to inform follow-up instructional actions. From a technological perspective, KIPIN PTO accelerated grading and score compilation, reduced paper consumption, and minimized dependence on external internet connectivity. Assessment results became available immediately after students completed their assessments, allowing teachers to review and utilize the information more promptly. However, the advantages of the offline system did not eliminate its dependence on supporting infrastructure. The server and devices still required a stable electricity supply. Limitations related to power availability, device battery capacity, and the provision of backup devices remained important considerations for ensuring the continuity of KIPIN PTO implementation.

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To clarify the relationship between the findings from the two schools, the cross-case analysis revealed three key patterns (table 4). First, pedagogical planning was evident at both schools, although the technical procedures for uploading assessment materials differed. Second, the local network enabled assessments to be conducted without external internet connectivity, but it did not eliminate dependence on electricity and digital devices. Third, teachers at SMP Negeri 1 Motui reported greater autonomy in interpreting assessment results and implementing follow-up instructional actions, whereas at SMP Negeri Satap 7 Oheo, these processes were largely facilitated by the system operator, and some follow-up actions remained at the planning stage. This comparison suggests that the maturity of technology-use practices plays a more significant role in the utilization of assessment reports than the mere availability of technological features.

**Table 4. Cross-Case Comparison of KIPIN PTO Implementation at Two Public Junior High Schools in North Konawe Regency**

| **Dimensi** | **SMP Negeri 1 Motui** | **SMP Negeri Satap 7 Oheo** |
|---|---|---|
| Implementation Experience | Implementation Experience | Implementation Experience |
| Approximately three years | Approximately three years | Approximately three years |
| Approximately one year; initial use for summative assessments in June 2026 | Approximately one year; initial use for summative assessments in June 2026 | Approximately one year; initial use for summative assessments in June 2026 |
| Assessment Input and System Configuration | Assessment Input and System Configuration | Assessment Input and System Configuration |
| Teachers prepared and uploaded assessment materials with support from the system operator | Teachers prepared and uploaded assessment materials with support from the system operator | Teachers prepared and uploaded assessment materials with support from the system operator |

More specifically, follow-up instructional actions at SMP Negeri 1 Motui included reported remedial instruction and enrichment activities, such as reassessments and additional assignments, supported by observation records and school program documents. At SMP Negeri Satap 7 Oheo, remedial documentation contained lists of students requiring additional support and plans for reassessment, while a formal written enrichment program was reportedly not yet available. Teachers also described plans to revisit learning topics and adjust instructional strategies. However, the available evidence was insufficient to establish the effects of these actions on students' learning achievement.

These differences in the implementation of follow-up instructional actions indicate that the benefits of KIPIN PTO cannot be assessed solely on the basis of its successful use for administering digital assessments. The system's primary value lies in its ability to generate information that can be utilized to inform subsequent teaching and learning activities. Using assessment results to identify students' learning difficulties, determine content areas requiring further instruction, and plan appropriate follow-up actions demonstrates a shift from viewing assessment merely as a measurement activity toward recognizing it as a source of information for instructional decision-making.

Given the technical challenges and differences in teachers' ability to utilize assessment results, the sustainability of KIPIN PTO implementation primarily requires improvements in two key areas. First, infrastructure needs to be strengthened through the provision of backup power supplies and supporting devices. Second, teachers' competencies

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and autonomy need to be enhanced through training and ongoing assistance in using KIPIN PTO. Both aspects are essential to ensure that the system is not only technically operational but also effectively integrated into digital assessment practices.

***Discussion***

**1. Digital Assessment Planning Using KIPIN PTO**

The findings indicate that assessment planning using KIPIN PTO begins with pedagogical considerations before addressing technical aspects. Teachers first establish assessment objectives based on Learning Outcomes (CP) and Learning Objectives (TP), determine the type of assessment, develop assessment blueprints and instruments, select question formats and the number of items, establish assessment duration, and subsequently prepare devices, user accounts, servers, local Wi-Fi networks, and students' readiness. These findings emphasize that the integration of technology does not replace the fundamental principles of assessment. KIPIN PTO serves as a digital platform for assessment administration, while assessment quality continues to depend on the appropriateness of the objectives, instruments, and procedures designed by teachers.

These findings are consistent with Muhadi et al. (2025), who explained that assessment quality is strongly influenced by the quality of planning, as this stage determines the competencies to be assessed, assessment instruments, scoring procedures, and the utilization of results. In the present study, this principle was reflected in teachers' practices of developing assessment questions based on CP and TP and ensuring that the relevant learning content and indicators were adequately represented before uploading the instruments into the system.

Alignment between assessment instruments and learning objectives is another essential consideration. Teachers developed assessment blueprints specifying learning content, indicators, cognitive levels, question formats, and item distribution. This process is closely related to assessment validity. Gitomer et al. (2021) emphasized the importance of validity and reliability in ensuring that assessment results can support educational decision-making. Similarly, Meylani (2024) highlighted validity, reliability, objectivity, and practicality as essential principles for generating accurate information about students' learning progress. The use of assessment blueprints demonstrates that digitalization involves more than transferring paper-based questions to a digital interface; it also requires a systematic and purposeful approach to assessment design.

In addition to the accuracy and appropriateness of assessment instruments, KIPIN PTO planning involves substantial technical considerations. Servers, local Wi-Fi networks, user accounts, assessment schedules, devices, battery capacity, and backup devices are essential components of assessment readiness. This indicates that digital assessment requires more comprehensive planning than paper-based assessment, as it involves the interdependence of users, devices, networks, servers, and electricity supply.

These findings are consistent with Ashari et al. (2023), who found that the implementation of electronic assessment requires technical and pedagogical readiness as well as organizational support. In the present study, pedagogical readiness was reflected in the development of assessment objectives and instruments, while technical readiness was demonstrated through the preparation of servers and devices. Organizational support was evident in curriculum coordination, the provision of facilities, and the involvement of system administrators.

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Beyond infrastructure and school-level coordination, students' readiness is another important consideration. Teachers communicated assessment schedules, provided instructions for accessing the system, distributed user account information, and ensured that devices were ready for use. Rofi'ah et al. (2024) explained that user readiness influences the successful implementation of technology-based assessment. In this study, such readiness encompassed not only the ability to operate the application but also device preparedness and an understanding of assessment procedures.

The interrelationship among assessment content, technological devices, and users can be interpreted through the Technological Pedagogical Content Knowledge (TPACK) framework. Jibril and Adedokun-Shittu (2023) explained that technology integration requires a combination of technological, pedagogical, and content knowledge. The use of KIPIN PTO requires teachers to understand learning objectives and subject matter, develop appropriate assessment instruments, and possess the technical knowledge needed to administer assessments in a digital environment. Institutional support also plays a crucial role, as implementation involves school principals, curriculum coordinators, and system administrators. This aligns with Sahra et al. (2025), who emphasized that educational innovation requires effective leadership and organizational support. Overall, KIPIN PTO assessment planning involves the integration of assessment objectives, technological readiness, user preparedness, and institutional support.

**2. Digital Assessment Implementation Using KIPIN PTO**

KIPIN PTO assessments at both schools were administered through local servers and Wi-Fi networks, eliminating the need for external internet connectivity during the assessment process. This finding demonstrates the suitability of the technology for the connectivity conditions at the research sites, rather than its resilience to all forms of technical disruption. A stable electricity supply, sufficient devices, and an understanding of operational procedures remained essential prerequisites. While previous research on assessment technologies has emphasized the benefits of automation (Ahmad et al., 2022), the findings from these two cases indicate that such technological benefits are closely linked to schools' organizational readiness.

At the procedural level, the implementation of KIPIN PTO involved the use of features such as timers, individual user accounts, assessment scheduling, question randomization, and the Monitor menu. These technological features facilitated question distribution, time management, response recording, automated grading, and score compilation. This finding is consistent with Ahmad et al. (2022), who explained that technology can automate various assessment processes, thereby reducing administrative workloads and improving efficiency. Nevertheless, teachers continued to play an essential role in assessment administration. They provided direct supervision, maintained classroom order, offered guidance, and ensured that students followed the established procedures. The digital system complemented these responsibilities by providing additional monitoring capabilities through its built-in features. This indicates that digital assessment is not an entirely automated process. Teachers remain responsible for pedagogical supervision and classroom management, while technology supports the administrative and technical aspects of assessment implementation. In addition to automation and supervision, the schools made efforts to ensure equal opportunities for students to participate in assessments by providing backup devices and technical assistance when account-related or battery issues occurred. This finding is consistent with Ashari et al. (2023), who emphasized that assessments should provide all students with equal opportunities to demonstrate their competencies.

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Although technical support facilitated assessment implementation, differences in teachers' autonomy provide an important context for understanding technology acceptance. At SMP Negeri 1 Motui, greater familiarity with the system supported more independent management of assessment questions and interpretation of results. In contrast, at SMP Negeri Satap 7 Oheo, the system operator remained responsible for uploading assessment questions and facilitating access to assessment results. From the perspective of the Technology Acceptance Model (TAM), perceived usefulness should not be equated with actual proficiency in using the system (Davis, 1989). As this study did not employ TAM measurement instruments, the model was used solely as an interpretive framework.

The need for continued support during the adaptation process is consistent with Susianto (2021), who highlighted that the successful use of KIPIN PTO is influenced by ease of use, teachers' readiness, and technical support. The findings also demonstrate that the offline system remains dependent on electricity, servers, and digital devices. This aligns with Mhlanga (2024) and Zamista (2022), who emphasized that the benefits of digital assessment are strongly influenced by infrastructure and user readiness. Accordingly, the implementation of KIPIN PTO can be understood as a form of local network-based digital assessment that integrates technological automation with human support.

**3. Utilization of Dashboard Analytics and Its Influence on Teachers' Instructional Practices**

The findings indicate that the function of KIPIN PTO extends beyond the completion of assessments. The dashboard analytics feature provides individual scores, class averages, mastery percentages, and item analysis results. Teachers use this information to identify learning content that students have not yet mastered, recognize students requiring additional support, determine topics that need to be revisited, adjust instructional strategies, and reflect on their teaching practices. These findings are closely related to the concept of Learning Analytics, which involves using data to understand and optimize teaching and learning processes. Assessment data acquire pedagogical value when they are used to improve instructional practices. In this study, teachers did not merely examine final scores; they also analyzed patterns of incorrect responses across test items, linked these patterns to specific learning content, and determined appropriate instructional actions, such as revisiting topics, providing remedial instruction, or modifying teaching strategies.

The use of assessment results as a basis for instructional decision-making is consistent with Susnjak et al. (2022), who explained that Learning Analytics supports the identification of learning risks and evidence-based decision-making. Caspari-Sadeghi (2023) also emphasized that analytical data can help teachers understand learning behaviors and support their instructional decisions. Similarly, Kharis and Zili (2022) reinforced the view that digital data can provide a foundation for identifying learning patterns and designing more effective instructional strategies. The relationship between dashboard analytics and teachers' instructional practices can be summarized as a sequence of information, interpretation, decision-making, action, and reflection. The system generates assessment data, which teachers interpret to identify learning content requiring further attention, adjust instructional methods, and reflect on previous teaching practices. These findings indicate a shift from score-oriented assessment toward the use of assessment information as a basis for instructional decision-making.

Regarding follow-up instructional actions, Rane et al. (2023) suggested that decisions informed by assessment evidence can support more adaptive teaching and learning practices. Visscher (2021) also explained that the consistent use of assessment evidence can enhance

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instructional effectiveness. The findings of the present study reflect this perspective, as dashboard information informed teachers' reported adjustments to instructional strategies based on identified learning difficulties. Reflection represents another important dimension of this process, as assessment data enable teachers to evaluate the appropriateness of their previously employed instructional methods. This aligns with Rosidah and Sugianti (2025), who conceptualized teachers as reflective practitioners. The findings are also consistent with Ulfah et al. (2025), who highlighted the capacity of digital assessment technologies to provide timely and accurate information that supports instructional decision-making.

However, the comparison between the two cases reveals an important limitation of learning analytics: information generated by the dashboard may stimulate reflection and instructional decision-making without necessarily leading to observable changes in teaching practices. Evidence from SMP Negeri 1 Motui primarily consisted of teachers' accounts of instructional strategies they had implemented, whereas findings from SMP Negeri Satap 7 Oheo indicated that instructional adjustments largely remained at the planning stage, with access to analytical information facilitated by the system operator. Other factors, including teaching experience, subject matter characteristics, and curriculum coordination, may also influence teachers' instructional decisions. This study did not isolate or establish the causal effects of dashboard analytics. Its empirical contribution lies in clarifying the mediating roles of teachers and school organizations in translating digital assessment data into instructional decisions and practices.

**4. Evaluation and Follow-up of Assessment Results**

The evaluation of both cases revealed several reported benefits, including automated grading, faster score compilation, reduced printing requirements, and the ability to operate without external internet connectivity. However, the extent of time and cost savings was not quantitatively measured. The findings also highlighted the system's continued dependence on electricity, digital devices, and technical support from system operators. The Context, Input, Process, and Product (CIPP) framework was employed as an interpretive tool to examine the findings after data collection, rather than as a formally administered evaluation instrument. Within this framework, the context referred to limited internet connectivity; inputs included teachers, system operators, servers, and digital devices; the process encompassed assessment implementation and monitoring; and the products consisted of the availability of assessment results and planned follow-up instructional actions (Russ-Eft et al., 2024).

When the evaluation focuses on post-assessment instructional responses, teachers at SMP Negeri 1 Motui reported implementing remedial instruction and enrichment activities based on assessment results. In contrast, documentary and observational evidence from SMP Negeri Satap 7 Oheo primarily indicated the preparation of remedial lists and the scheduling of reassessments, with no formal written enrichment program available. This gap suggests that the availability of assessment scores and item analysis results alone is insufficient to ensure the completion of the feedback cycle. This interpretation is consistent with the emphasis on using assessment information to improve teaching and learning practices rather than merely generating scores (Maki, 2023; Hooda et al., 2022).

Based on these technical and pedagogical findings, the evaluation of KIPIN PTO identifies two key areas for improvement. First, assessment results are used to enhance teaching and learning through remedial instruction, enrichment activities, and adjustments to instructional strategies. Second, experiences gained during implementation inform improvements to the system through strengthened infrastructure, enhanced teacher competencies, and greater institutional support. This pattern indicates that KIPIN PTO

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functions not only as a digital assessment tool but also as part of an ongoing process of improving assessment and instructional practices.

## Conclusion

The study conducted at two public junior high schools in North Konawe Regency revealed that KIPIN PTO assessment planning integrated the development of assessment objectives, blueprints, and instruments with the preparation of local servers, user accounts, devices, and assessment schedules. Although both schools demonstrated similar pedagogical approaches to assessment planning, they differed in their levels of technical autonomy. Teachers at SMP Negeri 1 Motui had relatively more experience using the system, whereas technical operations at SMP Negeri Satap 7 Oheo were primarily managed by the system operator. During the implementation stage, assessments at both schools were conducted through local networks without requiring external internet connectivity. The system automatically recorded assessment scores, while teachers remained actively involved in classroom supervision. However, the continuity of system use depended on the availability of a stable electricity supply, adequate devices, functional user accounts, and technical assistance. Following the assessments, the dashboard provided score summaries and item analysis results that could be used to identify students' learning difficulties. Teachers at SMP Negeri 1 Motui reported adjustments to instructional strategies and the implementation of follow-up actions, whereas teachers at SMP Negeri Satap 7 Oheo remained largely dependent on the system operator, with several instructional adjustments still at the planning stage. These findings do not establish a causal relationship between dashboard utilization and changes in teachers' instructional practices or improvements in students' learning outcomes.

Considering both the benefits and limitations of KIPIN PTO, the evaluation findings highlight the need to strengthen backup power supplies, improve the availability of supporting devices, enhance teachers' technical competencies through training, and systematically document the implementation of remedial instruction and enrichment activities. Future research could examine the extent to which follow-up instructional actions are implemented and their effects on students' learning achievement using an appropriate research design. The findings of this study are context-specific and cannot be statistically generalized.

## Recommendation

Based on the findings, schools are encouraged to strengthen the implementation of KIPIN PTO by improving infrastructure, providing backup electricity, ensuring adequate digital devices, and supporting teachers in using the system independently. School principals, curriculum coordinators, and system operators should work together to ensure that digital assessments run smoothly and that assessment results are used effectively. Teachers should receive practical training in preparing assessment instruments, accessing dashboard analytics, interpreting results, and planning remedial and enrichment activities based on students' learning needs. Schools should also regularly monitor and document follow-up instructional actions to support continuous improvement. Local education authorities are encouraged to provide technical assistance and resources, particularly for schools with limited internet access. Future research should examine how teachers implement follow-up actions and whether these practices contribute to improved learning outcomes. These efforts can help

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schools use KIPIN PTO more effectively as a tool for assessment and instructional improvement.

**Acknowledgment**

The authors would like to express their sincere gratitude to the school principals, teachers, learners, parents, and educational staff at the participating schools in North Konawe Regency for their valuable participation, cooperation, and support throughout the research process. The authors also gratefully acknowledge Universitas Muhammadiyah Kendari for its academic support and facilitation during the conduct of this study. Appreciation is further extended to all informants who generously shared their experiences and perspectives, which made a meaningful contribution to the completion of this research.

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