

Teacher's Sensemaking of Digital Technologies Integration for Assessment in High School Context

Nurhalimah Siregar¹, Iin Afriyanti Umar^{1*}✉

¹Faculty of Education, Universitas Islam Internasional Indonesia, Depok, Indonesia

*Corresponding Author: iin.afriyanti@uiii.ac.id

Article Information

Article history:

No. 1124

Rec. March 14, 2026

Rev. July 14, 2026

Acc. August 21, 2026

Pub. August 26, 2026

Page. 1695 – 1713

Keywords:

- Digital technologies integration
- Digital assessment
- Educational technology
- Teacher sensemaking

ABSTRACT

The rapid transformation of digital technologies in education has shifted traditional assessment process into a more flexible and data-driven approach that supports evaluating students' learning. In the Indonesian context, the teachers primarily use digital technology for administrative purposes and as a substitute for written exams rather than supporting formative assessment strategies and contextual summative assessments. The current study addressed to close a research gap by exploring high school teachers' sensemaking towards integrating digital assessment into classroom learning. This study is drawn from sensemaking theory by Karl Weick in 1995, which emphasizes the individual making sense process based on their experiences, beliefs, and environments. In this context of study, this theory examined how teachers interpret and negotiate to the digital assessment integration based on their prior knowledge, beliefs, contextual constraints, and learning objectives. The study used a qualitative research design through focus groups and semi-structured interviews with four high school teachers from different schools, subject areas, and years of teaching experience. The finding showed that teachers adapted digital assessment based on institutional mandates, learning objectives, and students' characteristics. Teachers perceived digital assessments as highly effective for enhancing administrative efficiency, professional routine, and student engagement, particularly through creative projects. However, they positioned digital tools as supplements rather than replacements, as digital assessment was deemed less effective in capturing students' moral character, productive skills (e.g., speaking), and authentic presence. Furthermore, the study revealed that teachers ensure assessment integrity through technological control and foster transparency by providing parents with real-time access to students' progress.

How to Cite:

Siregar, N., & Umar, I. A. (2026). Teacher's Sensemaking of Digital Technologies Integration for Assessment in High School Context. *Jurnal Teknologi Informasi Dan Pendidikan*, 19(2), 1695-1713. <https://doi.org/10.24036/jtip.v19i2.1124>

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1. INTRODUCTION

Digital integration into the teaching and learning process has become an inherent part of modern education, specifically the shift in how students' learning progress and achievements are assessed [1]. This shift was significantly accelerated by the COVID-19 pandemic, serving as a turning point for educational institutions to replace paper-based exams with digital evaluations [2]. Today, rapid digital integration transforms the traditional assessment process into a more flexible and data-driven approach that supports evaluating students' learning. Globally, digital assessment integration moves beyond a basic view of the medium for evaluating learning to a transformative approach that bridges the gap among curriculum, students' achievements, and the feedback process [3], [4].

According to Gomez and Ruiperez-Valiente [1], digital assessment refers to the evaluation of the learning process, which is supported by digital technologies. This includes the use of digital technology to design assessments and learning tasks, to evaluate students' performance and progress, and to provide feedback [3]. Additionally, digital assessments enhance both formal and informal assessments for formative and summative objectives [5] that use various instruments such as computer-based exams, mobile devices, and automated writing evaluation systems to collect empirical data regarding students' learning [6], [7]. The evaluation process involves both graded and non-graded processes, which are shared through digital media to inform students' performance and feedback [8]. Finally, digital assessment provides a structured way to monitor student progress, deliver immediate feedback, and adapt teaching through automated and web-based systems to improve learning effectiveness while considering the perceptions of both teachers and students.

In this global landscape, teachers play a significant role in the effective integration of digital assessment into classroom learning [9]. In this context, teachers' pedagogical skills and digital literacy determine whether digital integration transforms learning or merely replicates traditional practices. According to Brookhart [10], an effective digital assessment

implementation requires teachers' technical skills and their understanding in applying these skills within a specific context.

However, studies found that teachers encounter significant challenges during the integration of digital assessments, such as technical glitches, educational ethics, and timely feedback in the context of large-scale assessment [11]. In addition, teachers' perspectives and practices are influenced by their personal belief and their sense-making regarding the institutional rules and sociopolitical pressures that direct their tasks [12]. Many international studies have documented challenges, and there is a need to explore these digital assessment practices within the specific context of Indonesian secondary schools.

The current study explores the global perspectives of using digital technology in the educational context and focuses on assessment. While existing literature has extensively documented the technical adoption of digital education, particularly at the university level, there remains a critical gap in understanding how secondary school teachers conceptually negotiate and reshape their professional roles through digital assessment. Most studies focus on immediate pandemic-driven crises, treating digital tools merely as functional alternatives to paper-based testing. Consequently, how teachers internalize, resist, or reconstruct meaning around digital assessment in the stable, post-pandemic landscape remains underexplored.

In the context of Indonesian schools, the government promotes digital integration into the instructional process, including assessment. However, the success of digital integration depends on local teachers' understanding, interpretation, and adaptation in everyday teaching [13]. Therefore, exploring Indonesian teachers' understanding and practices is essential, as it has influenced the implementation of digital assessment [2], [6]. Consequently, this study aims to fill the gap between global digital trends and local pedagogical realities. Additionally, this study examines how to ensure effective digital assessment practices to enhance student learning and achievement within the national context.

Utilizing Weick's sensemaking framework, the current study bridges this gap by exploring the situated practices, shifting professional identities, and pedagogical negotiations of Indonesian high school teachers integrating digital assessment. Beyond providing a localized account, this study contributes to the global discourse by conceptualizing digital assessment not merely as an administrative tool for efficiency, but as a catalyst for a hybrid professional identity and an inclusive, also democratized classroom space. Based on this backdrop, the research addresses the following questions:

RQ1: How do high school teachers perceive the integration of digital assessment into classroom learning?

RQ2: How do high school teachers integrate digital assessment into classroom learning?

Sensemaking theory was developed by Karl Weick in 1995 which is defined as individual understanding and practice in a new condition [14], [15], [16]. This theory focuses on the

process of people making sense of their experiences, especially within a new phenomenon or transformation such as digital transformation during the COVID-19 pandemic [17]. In the school context, sensemaking theory refers to teachers' interpretation during their adaptation to the new policies and integration within their environment [15].

The sensemaking process involves continuous interaction between teachers' personal perspectives and the external environmental demands. Teachers' personal perspectives include their prior knowledge, current practices, and personal beliefs [18]. While the external demands include expectations from the schools, the government, and technology [19]. The theory distinguishes various steps involved in the process, starting with identifying indicators, followed by reflecting on previous experiences, and concluding with implementation [16], [17]. In the context of digital integration, the theory helps teachers move from adopting new digital tools towards purposeful integration in the teaching and learning process.

Several studies applied sensemaking theory to understand teachers' experiences during digital integration, especially for evaluating learning and supporting student learning progress. For example, a one-to-one laptop program to learn analytics and artificial intelligence consistently underscores that technological presence does not inherently guarantee a fundamental shift in pedagogical methods. The study shows a persistent discrepancy between the objectives of digital integration and teachers' practices in the real context. It suggests that technology is only a tool, and that teachers play an important role in determining its implementation based on their personal beliefs and external environmental support [15]

On the other hand, van Leeuwen et al. [20] conducted a case study on teachers' experiences in using learning analytics, such as a real-time dashboard to monitor students' digital collaborative learning. The study found that teachers see digital dashboards as a compass to maintain their attention during the busy time in the classroom by deciding which student or group needs help and guidance during the learning process. However, this study also found that teachers often reject digital data when they see the gap between the information from digital dashboards and the real students' condition. The study highlighted that sensemaking theory is a constant balance between the digital data from the [15] dashboards and teachers' personal judgment.

A recent study explored Artificial Intelligence (AI) integration [16]. The study highlighted that the success of AI integration needs teachers' interpretation of the goal and ethical values of using AI during the instructional process. In this study, the sensemaking theory helps them to determine whether an AI tool is a helpful assistant or a risk to their pedagogical responsibility. For example, researchers found that teachers construct meaning of the digital values and their objectives. This means that teachers play an important role in determining whether a digital dashboard is used to support students or to monitor them.

These studies underscore that technological integration does not inherently guarantee pedagogical transformation. It suggests that the success of digital integration

remains fundamentally contingent upon the teacher's active interpretation and professional beliefs. Guided by sensemaking theory, this process represents a continuous negotiation between digital evidence and human judgment, positioning teachers as the primary agents who determine whether technological tools serve as empowering facilitators or potential risks to pedagogical integrity.

2. RESEARCH METHOD

2.1. Research approaches

The researchers used a qualitative approach to investigate high school teachers' sensemaking of digital technologies integration for assessment. According to Creswell & Gutterman [21], qualitative research involves comprehending the meaning that individuals or groups attribute to a social issue. Researchers who used this approach also value an inductive methodology that considers the importance of personal meaning [22]. By adopting an inductive approach, this research allowed themes and patterns to emerge naturally from the data.

2.2. Research Design

This study employed a descriptive case study design, which is part of the qualitative method that is commonly used in social research, including education [23], [24]. A case study focuses on a single case to provide an in-depth analysis of a program, activity, process, or individuals [25]. There were two specific considerations for using a case study in this research. First, this study was designed to address "how" questions [26] that were formulated both in the first and second research questions. Second, this study focused on the teacher's personal experience, in which each individual produced unique and varied insights [27].

2.3. Research Subjects

Purposive selection was used to select research participants. According to Creswell & Gutterman [21], purposeful sampling identifies and selects individuals or groups who mostly understand and experience the phenomenon of interest. The participants recruited for this study were selected based on the following criteria: Indonesian teachers with a minimum of two years of experience in integrating digital assessment. The study involved four participants from four different schools in Indonesia. To ensure confidentiality, pseudonyms were used to replace the participants' names.

Table 1. Participant Profile

Pseudonym	Age	Background of study	Teaching experience (year)	Subject
Lina	34	Bachelor's Degree	10	English
Sulis	33	Bachelor's Degree	10	English
Riri	28	Bachelor's Degree	3	Science
Chiro	38	Bachelor's Degree	15	Islamic Education

2.4. Methods of Data Collection

This study aimed to gather data on two major areas: teachers' perceptions and practices. Thus, it utilized systematic steps involving both focus groups and semi-structured interviews. Focus group interviews were employed to gain a collective understanding from the participants [28], with two teachers participating in the session. To obtain rich data and prevent participants from following their peers' responses, the researcher provided an initial disclaimer, encouraging each teacher to express their perspectives based on their own understanding and unique experiences without being distracted or influenced by others.

Another method used in this study was a semi-structured interview, which involved collecting data from one participant at a time [28]. This approach was selected considering the deeper explanation of the respondents. Also, it allowed the researchers to ask follow-up questions to clarify any points raised during the interaction. For ethical considerations, permission was obtained from all participants, and the purpose of the study was clearly explained before the sessions. Participation was entirely voluntary; the teachers were free to choose whether to participate in the study. They were able to withdraw whenever they felt uncomfortable maintaining their identity, and any information shared by participants was kept strictly confidential.

2.5. Methods of Data Analysis

The first step in data analysis involved structuring the extensive information collected by converting spoken or written words into a typed file and deciding whether to analyze the data manually or using computer software [28]. Before structuring the data collected, the researcher transcribed the data from focus group interviews and semi structured interviews. Then, the data was translated into English since it was in the Indonesian language. After all the English data was collected, the researcher collected and structured all the data.

In analyzing the data, this study applied reflexive thematic analysis. The analysis was conducted manually since the researcher intended to have direct experience through the process. The reflexive thematic analysis followed the six stages outlined by Braun and Clarke [29], which include getting familiar with the data, conducting coding, and creating initial themes. It then progresses to reviewing, defining, naming the themes, and finally producing the report.

3. RESULTS AND DISCUSSION

3.1. Findings Research Question 1

The first research question of this study is: How do high school teachers perceive the integration of digital assessment into classroom learning? To elaborate on the first research question deeply, researchers also asked the participants to what extent the integration of digital assessment benefits the teaching and learning process. Drawing on the major themes that emerged from the analysis of the focus group and semi-structured interviews, three main themes depicting teachers' perceptions were identified through reflexive thematic analysis: (1) Rethinking teachers' professional identity, (2) Promoting student learning, and (3) Perceiving digital assessment as a supplement. Through the lens of sensemaking theory proposed by Weick (1995), these themes demonstrated how teachers reflected on traditional practices and enacted new, more efficient, and adaptive realities.

3.1.1. Rethinking teachers' professional identity

A discussion regarding the shift of teachers' professional identity appeared in all teachers' responses. This theme discussed how participants redefined their professional roles, moving from traditional evaluators to digital native facilitators, specifically in the post-COVID era. The transformation of teachers' identities underscores a fundamental paradigm shift, which is beyond the adaptation of working media [15]. In this sense, the COVID-19 pandemic created an urgent need for schools to maintain instructional continuity, prompting teachers to adopt digital platforms such as Google Classroom, Zoom, and Google Drive. As mentioned by Teacher Sulis, "The shift began during COVID-19, when schools were required to ensure learning continued effectively..."

The above finding illustrates how the adoption of digital assessment was not initially driven by pedagogical preference, but by necessity. Based on the sensemaking theory, the pandemic served as a situational cue that forced teachers to shift from traditional assessment methods to adapt to technological advancements [17]. The finding also suggests that the integration of digital technology into classroom learning did not initially stem from teachers' personal needs; instead, it was fundamentally driven by coercive external forces. This trajectory strongly aligns with the sensemaking framework by Stollman et al. [19], which posits that individuals' sensemaking processes are heavily shaped by external institutional demands.

However, the utilization of technology due to these crisis-driven circumstances did not burden the teachers. Conversely, teachers already felt comfortable using digital technology in their teaching and learning, and this comfort persisted even after the pandemic ended. Schools started to consider digital tools as an integral part of institutional development that required consistent improvement. Teacher Sulis's comment exemplifies this: "Currently, digital assessment in our school has become more structured with the

support of an internal IT team.” This indicates that teachers began to recognize the intrinsic pedagogical benefits of digital integration.

This shift from mandated adoption to internal value alignment is evidenced by the school’s willingness to invest resources, such as employing a dedicated internal IT team, to ensure the continuity and optimization of these digital practices. Consequently, this finding stands in contrast to Gherardi’s study [15], which argues that the superficial integration of digital tools often fails to fundamentally alter established pedagogical methods. Conversely, the current study demonstrates that when technical support systems are structurally embedded within the institution, they can successfully foster digital transformation, particularly in reshaping assessment and learning evaluation.

In addition, teachers perceive technology as a significant improvement in their professional routines. Using digital assessment can eliminate teachers’ technical workload, such as checking each student’s work manually. According to the teachers, the assessment process has become substantially faster due to technology. The teachers’ role shifted toward preparing materials on a digital platform, while the grading system automatically generated results after submission. As Teacher Chiro confessed, “Using digital assessment is very helpful for teachers; the system immediately displays the test result once students have finished their test”. According to sensemaking theory, teachers make meaning retrospectively through reflection on the pragmatic advantages of digital integration, such as the reduction of administrative workloads [30].

This efficiency granted teachers more time to engage in other productive professional activities, including upgrading their technological skills. Teacher Riri reported, “In this digital era, we have to continuously update our competence in utilizing technology; otherwise, digital-native students may be able to exploit technological gaps, for instance by cheating during assessments or using third parties to complete their assignments.” As a consequence, teachers are required not only to adopt digital tools but also to become facilitators who can guide digital-native students in navigating technology responsibly and ethically. In this sense, teachers realized that the digital assessment integration transforms their role [31] from “answer checkers” into facilitators that promote students’ digital literacy.

The demand for continuous learning also reflects teachers’ internal beliefs regarding professional responsibility and credibility. This aligns with the notion that teachers’ responses to innovation are heavily shaped by their personal perspectives, including prior knowledge and everyday practices [18]. Ultimately, teachers’ identities are a hybrid, which is a traditional teacher to maintain the institutional values and a learner to upgrade the technical skills at the same time [18]. In this manner, digital assessment became meaningful not merely because it was mandated by the institution, but because it resonated with the teachers’ internal reflections and their ongoing efforts in a changing educational landscape.

3.1.2. Promoting student learning

This theme focuses on how teachers captured positive cues from students during the integration of digital assessment in the classroom. Teachers perceived that the use of technology fundamentally altered students' levels of interest and engagement in learning. For example, Teacher Sulis and Teacher Riri noted that their students felt much "happier" when completing digital-based assignments. Teacher Riri observed that students responded more enthusiastically compared to conventional methods, particularly in traditionally challenging subjects like mathematics, suggesting that digital platforms created a more dynamic classroom atmosphere. Similarly, Teacher Lina experienced a surge in student engagement during creative digital tasks, claiming, "Students went 'all out' and put a lot of thought into their preparations when I gave them a podcast assignment." In this sense, digital assessment provides students with autonomy to exercise creativity, which is beyond the limited paper-based assessment [32]. Consequently, these positive student responses served as vital situational cues that allowed teachers to embrace their roles as facilitators who actively promote student learning.

Beyond increasing general engagement, teachers also perceived digital assessment as a structural "safe space" for students with diverse personality traits. Remarkably, Teacher Riri reported that quiet and less expressive students demonstrated greater confidence when articulating their ideas through digital assessment platforms. Within this digital environment, the "safe space" phenomenon effectively mitigated social pressure and peer anxiety, particularly for introverted students. While this finding aligns with Blundell's [32] assertion that digital assessment enables student-centered evaluation, the current study extends this notion by demonstrating that digital tools actively democratize inclusive classroom participation.

According to Weick's [33] sensemaking framework, this observed increase in student engagement is central to the teachers' ongoing interpretation of educational change. Specifically, the findings highlight the process of "extracting cues", one of the core properties of organizational sensemaking. Teachers constructed meaning by interpreting specific cues within their immediate environment, such as students' smiles during activities, their careful preparation for digital projects, and the unexpected courage of quiet students to voice their thoughts. Through these everyday classroom interactions, teachers framed digital assessment not as a mere administrative mandate, but as a meaningful pedagogical action. This stands in sharp contrast to prevailing literature, which frequently positions digital integration as a classroom distraction [6]. Ultimately, these extracted clues enabled teachers to align their pedagogical beliefs with institutional digital mandates [4], allowing them to exercise professional agency within technical limitations. By interpreting these small shifts as empirical evidence of success, teachers did not rely solely on formal standardized achievement data, but rather on significant, lived classroom moments to make sense of their evolving practice.

3.1.3. Perceiving digital assessment as a supplement

This theme underscores teachers' critical awareness of the fundamental limitations of digital assessment. Teachers do not view digital assessment as a complete replacement but rather as a complementary tool whose use depends heavily on learning objectives and student needs. It highlights that digital tools cannot replace the human dimension and educational values despite their effectiveness. Based on the interview findings, we found that teachers acknowledged that digital tools also come with various limitations and practical challenges in classroom implementation. These include difficulties in assessing certain types of competencies, technical constraints, and barriers in a specific subject. Such awareness demonstrates that teachers do not adopt digital technologies uncritically. Instead, teachers approach them with careful consideration. In this sense, teachers position themselves as reflective practitioners who continuously evaluate the strengths and weaknesses of digital tools. This critical engagement reflects an ongoing reshaping of teachers' professional identity, as they become adaptive facilitators who critically integrate both digital and conventional assessment practices.

Several teachers illustrated these limitations through their classroom experiences. Teacher Lina, for instance, argued that digital assessment cannot adequately measure "students' productive skills," particularly when assessment requires observing processes, expression, or hands-on performance. For her, digital tools function better as support mechanisms rather than substitutes for direct evaluation. According to sensemaking theory, it shows negotiated practice in which teachers harmonize the external demands of digitalization with their beliefs about high-quality assessment [20]. Similarly, Teacher Riri described challenges in Arabic lessons, particularly when she needs to type Arabic words in digital applications. She explained, "For Arabic, the main difficulty lies in the writing system. When we type in Arabic, the formatting often changes once it is pasted into the CBT (computer-based testing) application." These examples highlight that while digital assessment offers efficiency and flexibility, its implementation still requires teachers' contextual adaptation. Consequently, teachers play an important role in determining whether digital tools are appropriate or traditional assessments remain necessary.

Teacher Chiro further emphasized these limitations in the context of Islamic education. According to her, aspects such as worship practices and oral recitation must still be assessed directly to ensure accuracy and authenticity. Observing students' pronunciation, movements, and sincerity requires physical presence and careful listening. It underscores teachers' preferences for conventional methods to maintain moral standards that cannot be replaced through digital algorithms. In other words, digital assessment is accepted, but within clear pedagogical boundaries. It highlights teachers' professional agency in navigating the digital demands. This finding aligns with Brookhart's [10] argument that the effective implementation of digital assessment requires teachers not only to possess technical skills but also to understand how and when to apply those skills in

specific learning contexts. This study found that teachers' practices in integrating digital assessment selectively highlight their digital literacy competencies [31]. Through this process, their professional identity is reshaped as they move beyond traditional evaluators toward reflective facilitators who decide on the appropriate integration of digital and conventional assessment methods.

3.2. Finding Research Question 2

The second research question of this study is: How do high school teachers integrate digital assessment into classroom learning? The findings show that high school teachers do not just stop at technical integration; instead, they move beyond basic technical adoption into situated practices that are actively shaped by how they interpret the demands of digital transformation in the educational landscape. According to the participants, digital assessment was integrated through adaptive adjustment toward the institutional policies and redesign of the pedagogical method and classroom activities. Utilizing sensemaking theory, the data shows that teachers noticed the demands of digital transformation, such as the pandemic, school-level digital systems, and administrative needs. In this context, they interpreted the demands through their personal beliefs, experiences, and subjectivities, integrating digital technologies that align with their professional judgment to assess learning. In this sense, the process of digital assessment integration was strategically combined with manual feedback and face-to-face evaluation to maintain pedagogical integrity. These patterns indicate that the implementation of digital assessment is a continuous meaning-making process that shapes teachers' practices within their specific school context.

3.2.1. Adapting to digital demands

This theme highlights that teachers practice in integrating digital assessment as an adaptive adjustment toward the mandates and digital demands. The participants described the implementation of digital assessment into their classroom shaped by external factors such as the pandemic, the school's digital infrastructure, and the demands of an effective and efficient school administration. In this sense, teachers perceived the institutional policy (e.g., E-report) as a digital demand to which they have to comply to sustain their careers. It highlights that the systemic shifts are beyond personal initiative but shaped by external factors. According to sensemaking theory, teachers noticed the situational cues and responded to the changes by practical adjustment. Teachers' negotiation is reflected in their agency responding to the tension between the school's demands and their beliefs [18]. In other words, teachers identified the transformation within their professional environment and adapted the assessment process accordingly.

For example, Teacher Lina explained how she integrated a computer-based system (CBT) to evaluate students' learning and used another tool to adapt the digital

administrative demands for a regular report. According to her, CBT was used primarily for formative assessment, as she said, “We use computer-based technology that is linked to the E-report...”. This statement indicated that her school adopted digital technology partially and uses different tools for the assessment process and its report. It shows that teachers limit the technology used for administrative matters to reduce the workload rather than changing the pedagogical method. According to sensemaking theory, at the beginning of the meaning-making process, teachers perceived technology as aids to simplify rather than as a means of redesigning teaching [8]. In other words, the implementation of digital assessments in this context is procedural support rather than a holistic pedagogical transformation.

The finding is in line with the previous study which found that teachers integrated digital assessment as a response of top-down policies from the government and institution during the emergency time which is pandemic [13]. Additionally, this finding also supports the previous study, which highlights that most teachers interpreted their practices in shifting the assessment into an online form as a response to the sudden and rapid digital transformation [34]. It underscores that digital assessment is an additional burden without robust pedagogical integration [11]. It means that the workload burden constructs teaching understanding about digital assessment as a procedure for time efficiency rather than transforming the learning evaluation process [5].

According to the sensemaking theory, this practice represents teachers’ reflection on the changes that have happened in the environment. This means that the integration of digital assessment is not following the trend but responds to the institutional demands and digital transformation, which is shaping the assessment process. Based on this, digital assessment is negotiation-driven by the school’s transformation. In this sense, teachers become adaptive experts to ensure accountability through a transparent system [31] to the school’s community (e.g., stakeholders and parents).

3.2.2. Negotiating digital tool use through pedagogical justification

This theme highlights that teachers selectively curate digital tools based on their professional justification, beliefs, and subject-specific requirements. From a sensemaking theory, this reflected the tension between teachers’ perspectives and institutional demands. They interpreted digital assessment beyond the replacement for paper-based assessment. In this sense, they negotiated meaning by treating technology as an assistant rather than an authority [16]. This demonstrates teacher agency in prioritizing pedagogical quality over operational speed [5].

For example, one of the participants described her experiences in using digital tools for evaluating learning and traditional assessments based on subject-specific criteria. This means that she continued to balance the method of assessments due to some considerations. She described that her decision to use digital assessment was based on teachers’ and

students' needs by saying "digital assessment is optional...". In her context, the learning management system called Quintal is an integrated digital system for learning activities including students' attendance, grading, exam administration, and parental access. Despite the strong structural system, she refused to depend entirely on digital tools to assess students' learning, especially to measure students' language skills. For her, the decision to adopt digital assessment was heavily driven by specific goals of the subject. From a sensemaking perspective, she extracted cues based on the characteristics of the subject being taught. She acknowledged that digital tools cannot fully assess students' listening and speaking skills. Her decision on manual assessment over digital assessment reflected her belief that the authenticity of language skills could only be validated through direct human interaction. In her reality, this face-to-face interaction possessed greater plausibility than rigid digital data [20], highlighting that a teacher's decision is essential despite a highly structured school system.

In a similar vein, the Islamic Studies teacher emphasized traditional method in assessing productive skills, such as memorization of specific Islamic texts. The teacher believed that certain competencies, such as performance-based skills, were better evaluated through direct interaction. Therefore, digital assessment in this context was practiced selectively rather than holistically across all evaluation processes. This selective adoption underscored the fact that digital assessment integration does not automatically eliminate traditional methods [15], instead, it highlighted the practical boundaries where technology becomes less effective [10]. This finding aligns with van Leeuwen et al. [20], who argue that teachers tend to reject digital tools when they found a significant gap between the online-generated information and students' actual performance. In this sense, limiting the use of digital tools for assessment emphasized a teacher's conscious decision to maintain pedagogical responsibility [16], ensuring that the assessment remained both ethical and accurate. This process demonstrated teachers' negotiation in implementing digital assessment based on their beliefs rather than avoiding the digital system.

These findings align with an established study, which identified that teachers' digital literacy competencies enabled them to make informed decisions when selecting digital tools with some considerations [31]. In addition, the study highlighted teachers' reasons to utilize digital tools to improve students' learning rather than following the digital demands. This supports the current study that teachers curated the tools, especially for assessment, based on their professional perspectives. Furthermore, a study showed that teachers make decisions within the digital environment based on their personal beliefs and culture [12]. The results offer a new insight that digitally literate teachers are capable of thinking critically in using and avoiding the blind adoption of digital tools. In contrast to Gherardi's study [15], which viewed teachers' inconsistency as a weakness, the current study highlights that teachers' practice in shifting the assessment methods demonstrated their agency through ongoing assessment in selecting the appropriate tools based on their retrospective reflection on everyday teaching experiences. Specifically, the study found that teachers rejected

adopting new digital tools when they saw limitations in the tools, such as a lack of control for valid assessment. This confirmation proved that teachers integrated digital assessment selectively based on their personal perspectives.

3.2.3. Redesigning digital assessment activities toward pedagogical innovation

This theme highlighted teachers' practices in redesigning the digital assessment with classroom activities. Their practices went far beyond merely replacing paper-based exams with online formats; instead, they incorporated digital projects and interactive applications into their teaching. This shift demonstrated that teachers viewed technology as a tool for constructing a dynamic learning environment rather than a replacement for paper-based examinations [8]. Through sensemaking theory, the integration of digital assessment aims to align the curriculum demands with students' characteristics [18].

For example, Teacher Riri stated that she integrated digital projects for the final examinations of the science subject that support students' engagement in learning. She described that digital projects were not the main tool to assess students' learning nor to replace the structured digital system in her school. In this sense, she extracted cues through students' emotional feelings (e.g., boredom and demotivation) as situational cues that encouraged her to shift the pedagogical method [14]. It means that she negotiated digital integration with students' pedagogical needs to ensure the sustainability of student learning motivation. She said that "my students will be bored with the same strategy; thus, I use various strategies for assessment...". This statement showed that she observed students' needs, especially on specific topics such as science formulas. In her school's context, the use of computer-based assessments was limited, particularly for formative assessments. In addition, her school's context used different digital tools for assessment and students' reports, which are called a simple report. It means that digital assessment was part of the teaching strategy rather than a systemic learning transformation. It highlighted that the integration of digital assessment is based on the teacher's observations of students' characteristics.

On the other hand, teacher Sulis described that digital assessment in her classroom was integrated with digital projects such as collaborative videos, storytelling, and presentations. As she said, "all the projects are using digital tools...". This statement showed that digital tools were used in all students' activities, including learning and examinations. In her context, the integration of digital tools was implemented comprehensively, especially in assessing students' learning. This highlighted the transformation of the teacher's agency through integrating digital projects. She reflected that digital projects develop students' autonomy as digital natives. She transformed the assessment into retrospective sensemaking for students by redesigning the activities through collaborative projects. In this sense, students constructed deep understanding while creating digital projects rather than

simply answering questions [32]. These practices showed that teachers changed the traditional assessment into digitally mediated and student-centered learning.

This finding supports the previous studies, such as Blundell [32], which observed that utilizing digital tools such as e-portfolios and game-based environments enables teachers to develop learning evidence through student-centered assignments. This finding supports that the integration of digital projects improved students' engagement. It confirmed that the effectiveness of digital assessment relied on teachers' digital literacy skills in designing assessments that enhanced critical thinking and creativity, which were beyond paper-based examinations [31]. Additionally, the previous study found that the use of digital projects such as videos and blogs with peers was effective in assessing students' understanding of the subject. In this regard, digital projects allowed students to develop their critical thinking and creativity, which are integrated into everyday teaching. These studies supported the current study that digital assessment integration goes far beyond a simple shift from traditional testing, evolving instead into the intentional redesign of meaningful learning experiences.

3.2.4. Ensuring academic integrity: orchestrating technological controls and transparency

This theme showed that teachers in this study not only integrated digital assessment but also ensured the integrity and transparency of the digital assessment process. The majority of the participants agreed that digital assessment offers transparency, which allows students and parents to see the evaluation process. In this regard, digital integration transformed the assessment process from a closed process into a transparent ecosystem [35]. In this sense, teachers used data as evidence to establish accountability before parents and institutions. Additionally, they described that digital assessment was utilized to reduce academic dishonesty, such as cheating during the exam. Therefore, teachers practiced technological control to respond to the risks and negative issues related to the assessment process [35].

For example, Teacher Lina described an applied safe exam browser (SEB) during the summative assessment to ensure the integrity of the assessment process. According to her, this practice was a response to their concern regarding the potential for students to cheat by using the internet. As she said, "students are often using ChatGPT during exams to find the answers...". Based on sensemaking theory, SEB was a response to threat cues from generated AI that she believed might compromise the credibility of the assessment [36]. In this sense, the teacher applied "defensive practices" to ensure her agency against digital cheating. It was a crucial measure to ensure the validity and reliability of student assessment outcomes [34]. Within this context, digital integration was systematically adopted for all learning activities; however, teachers were concurrently tasked with maintaining academic equality.

In addition, Teacher Sulis added that the school's digital system, called Quintal, provided access for parents to observe students' progress in real-time. The results of the assessment were uploaded to this system, including students' attendance and learning progress, so that parents could access them from time to time. In this sense, teachers realized that transparency was a key point to mitigate the risk of public distrust [31]. Through the digital system, teachers manifested social sensemaking by involving parents as external supervisors to strengthen the integrity of the school ecosystem. This practice highlighted the transparency and monitoring process by offering institutional accountability.

The results of this study regarding the integrity and clarity of digital assessment were aligned with previous studies, which explored teachers' use of assessment validity by monitoring students' progress to make sure that students did the assessment independently. A previous study highlighted that students' academic dishonesty during exams was a primary teachers' concern [11]. Hence, teachers needed specific strategies to avoid the risks (e.g., plagiarism and cheating) by limiting the time and blocking students' access to find the answers. The present study was extended by emphasizing that teachers' reflections and digital literacy competencies empowered them to design proactive security protocols. In contrast with Gherardi's study [15], teachers in this current study reconstructed technology as a surveillance instrument that reinforces academic integrity through an unmanipulable transparency system. This study highlighted teachers' practices in controlling the system to ensure the integrity and transparency of the assessment process.

4. CONCLUSION

This study concludes that secondary school teachers' sensemaking (meaning-making process) of digital assessment integration is a situational and ongoing practice, shaped by the interplay between external demands and internal professional beliefs. Addressing the core research questions, the study demonstrates that teachers perceive digital assessment as a tool that improves the efficiency of professional routines and student engagement. However, teachers still position it as a supplement due to technological limitations in capturing human dimensions, such as moral character and certain productive skills.

This work advances the field of educational technology integration by providing empirical evidence that digital transformation in schools is not merely a technical medium replacement, but rather a process of negotiating meaning in which teachers actively curate tools, redesign activities into creative projects, and apply technological controls to maintain academic integrity. This provides scientific justification that the role of teachers remains central; technology is only a tool, while teachers' pedagogical beliefs and judgments determine the effectiveness of its implementation.

Practically, these findings have important applications for teacher professional development and policy implementation, where training should not only focus on technical

skills but also on teachers' capacity to apply those skills contextually in accordance with specific learning objectives. This study also emphasizes the importance of institutional accountability through a transparent system for parents.

As an extension of this research, future studies are recommended to explore digital assessment practices on a broader scale or use longitudinal methods to understand how teachers' evolving interpretations change with the development of more sophisticated AI technology. Further research is also needed to address the gap between global digital trends and local pedagogical realities in various regions of Indonesia.

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