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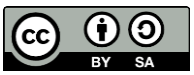

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# AI-Based Teacher Assistants in Indonesian Public Schools: A Case Study of Teachy

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**Abstract**

This study examines how Teachy, an AI-based educational platform, supports teachers' work in Indonesian public schools. Conducted in Lumajang Regency, East Java, a rural region with limited technological resources, the qualitative case study involved four teachers from junior and senior high schools using Teachy for at least one academic semester. Data collected during the even semester of the 2024/2025 academic year, through interviews, observations, and document analysis, were analysed thematically. Eight themes emerged, including workload assisting, cognitive and pedagogical shifts, emotional responses, leadership support, collaboration, and sustainability challenges. Teachers reported saving 2–4 hours weekly on planning and assessment tasks through automation features. However, barriers such as unstable internet access and insufficient digital literacy limited optimal use. One teacher noted that poor connectivity caused frequent interruptions during digital lesson delivery. The findings demonstrate that AI tools can enhance efficiency and instructional quality when embedded within supportive institutional environments. This study offers one of the few empirical examinations of AI adoption in rural Indonesian schools, contributing new insights to global discussions on AI integration in low-resource settings.

**Keywords**: *AI in education; digital literacy; teacher workload; Teachy platform*

## Introduction

Teacher workload has become a global concern, influencing teacher retention, job satisfaction, and instructional quality. Around the world, teachers are expected to manage not only classroom instruction but also extensive administrative tasks, assessment duties, reporting requirements, and communication obligations(Worth & Van den Brande, 2020; Zang et al., 2022). These pressures are even more pronounced in developing countries, where limited technological infrastructure, high student–teacher ratios, and bureaucratic demands intensify daily work

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challenges (Johnson & Renderos, 2020). As teaching responsibilities expand to include managerial and emotional labour, burnout and attrition have become persistent threats to education systems (Quickfall & Wood, 2024).

In Indonesia, these issues manifest strongly within the framework of national regulations. Permendikdasmen No. 11/2025 mandates a 37-hour-and-30-minute workweek, requiring teachers to balance classroom teaching with planning, assessment, documentation, mentoring, and involvement in school activities. Such cumulative demands frequently overwhelm teachers and complicate their professional responsibilities (Sari & Marliyah, 2020). The Job Demands–Resources (JD-R) model offers a useful lens for understanding this situation, arguing that when job demands exceed available resources, chronic stress and reduced performance can occur (Baker & Hawn, 2022).

Against this backdrop, artificial intelligence (AI) has emerged as a potential resource for alleviating teacher workload. AI-based platforms can automate routine tasks, support differentiated instruction, and generate data that informs pedagogical decisions(Christensen et al., 2020; Fisher et al., 2025). Yet, successful adoption depends on teacher readiness, institutional support, and infrastructural capacity (Alemdag et al., (2020; Lai & Jin, (2021). Teachy, an AI-powered teaching assistant developed in 2022, provides features such as automated lesson-plan generation, assessment creation, rubric design, and feedback tools.

Because these features are designed to streamline routine tasks, understanding Teachy's role early in the discussion helps clarify why this platform is central to the study. Designed with under-resourced contexts like Indonesia in mind, it offers features such as automated lesson plans, question banks, rubric generators, and AI-based analytics to streamline workflows and enhance instructional quality (Talwar, 2023).Empirical research examining real-world adoption in rural Indonesian schools remains scarce.

Despite growing interest in AI-driven educational tools, empirical research examining their actual use in classroom settings, especially in non-Western, low-resource environments, remains limited. Most existing studies focus on systemic challenges or highlight the theoretical benefits of AI integration, often neglecting teachers' lived experiences and perceptions of such platforms (Tarraya, 2023; Uzun et al., 2023). Furthermore, there is a lack of research addressing how critical contextual factors, such as leadership support, peer collaboration, and infrastructural readiness, affect the success of AI adoption in daily teaching practices.

This gap is particularly significant in regions such as Lumajang Regency, East Java, a rural district characterized by limited internet connectivity, varying levels of digital literacy, and uneven access to devices. Lumajang was purposively chosen for this study because it reflects the conditions typical of many Indonesian public schools outside major cities. Investigating AI adoption in such contexts provides insights that apply to a large proportion of schools in developing nations.

Guided by the JD-R framework, this study examines how teachers experience Teachy within their daily professional contexts. Specifically, it addresses two research questions: (1) How do teachers perceive the use of Teachy in managing their workload? and (2) In what ways does Teachy integrate into existing school contexts and teacher workflows? These questions contribute to broader discussions on digital equity, teacher well-being, and sustainable AI adoption in developing countries.

## Method

This study received ethical approval from the Research Ethics Committee of Universitas Islam Malang. All participants were informed about the purpose, procedures, risks, and benefits of the study. Participation was fully voluntary, and written informed consent was obtained before data collection. Participants were assured of confidentiality and informed of their right to withdraw at any time without consequences.

### *The Role of Researcher*

The researchers were graduate students with backgrounds in English education and educational technology. While one researcher had prior teaching experience in East Java, none had professional or supervisory relationships with the participants. Reflexivity was maintained throughout the research process to minimise potential bias, and analytic memos were used to document positional influences during interpretation.

### *Research Design*

This study employed a qualitative case study design to investigate how teachers in Indonesian public schools utilise the Teachy platform to manage their professional workload. The case study approach was chosen for its strength in providing an in-depth, contextualised understanding of complex phenomena within authentic educational settings. Rather than aiming for generalisability, the focus was on gaining detailed insights into teachers' experiences, practices, and challenges related to AI-based educational technologies. The study was underpinned by Activity Theory (Engeström, 2014), which emphasises the dynamic interactions between individuals, tools, and their social environments. In this context, Teachy served as a mediating artefact that shaped and was shaped by teachers' work, collaboration, and institutional contexts.

### *Research Participants*

Participants were selected from four public schools in Lumajang Regency, East Java. Recruitment followed purposive sampling based on two criteria: (1) teachers who had used Teachy for at least one academic semester, and (2) willingness to participate. One semester was considered adequate because it covers a full cycle of instructional planning, assessment, and reporting, ensuring teachers

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had sufficient experience with Teachy's features. All four teachers—three from junior high schools and one from a senior high school—volunteered to participate.

Participant Demographics

Table 1. Participants' Demographic and Professional Profile

| Participant | School Level | Subject | Years of Experience | Digital Literacy Level | Teachy Experience |
|---|---|---|---|---|---|
| YL | Junior High School | English | 10 + years | High | One academic year |
| P | Junior High School | English | 8 years | High | One academic year |
| EL | Junior High School | English | 6 years | Moderate | One semester |
| AM | Senior High School | English | 12 years | High | About 2 academic years |

***Data Collection***

Data collection was conducted over one month in the second semester of the 2024–2025 academic year. All participants had used the Teachy platform for at least one academic semester, which was considered adequate for developing functional familiarity through repeated use in lesson planning, assessment creation, and classroom instruction.

Three methods were employed: semi-structured interviews, classroom observations, and document analysis. Interviews were conducted in Bahasa Indonesia, lasted 45–60 minutes, and included open-ended questions on workload, pedagogical adaptations, and institutional support. All interviews were audio-recorded, transcribed, and translated into English using a two-step procedure that involved initial translation by a bilingual assistant and partial back-translation for accuracy.

Each teacher was observed twice to document real-time use of Teachy. Observation notes focused on digital tool use, teacher–student interaction, and student engagement. The observation process, however, carried limitations such as the potential observer effect and a limited number of sessions.

Document analysis supported data triangulation. Fourteen artefacts were examined, including four lesson plans, three assessment instruments, and seven Teachy-generated teaching materials. These documents provided additional insight into changes in instructional planning and design.

A demographic summary table is included to contextualise participants' backgrounds, including teaching experience, subject taught, school type, digital literacy level, and length of Teachy use.

***Data Analysis***

The collected data were analysed using Braun & Clarke, (2006) thematic analysis framework, which consists of six phases: becoming familiar with the data, generating initial codes, identifying and reviewing themes, defining and naming themes, and producing the final report. Both inductive and deductive coding approaches were applied to ensure that emergent insights were grounded in the data while also aligning with the components of Activity Theory, such as tools, community, rules, and division of labour. Data from interviews, classroom observations, and documents were cross-referenced to enhance the credibility and robustness of the findings through triangulation.

**Results**

This section presents the study's key findings, reorganized into three overarching categories: Benefits, Challenges, and Contextual Factors, to improve clarity and flow. Each theme is introduced with a brief explanation of its significance. Interview excerpts, observational notes, and document examples are integrated to provide a balanced account of teachers' experiences using Teachy.

1. Benefits

1.1. Assisting Workload

This theme highlights how Teachy eased administrative burdens such as planning and assessment. All four teachers mentioned this benefit.

YL, a 9th-grade teacher, remarked,

> "The automatic lesson planning feature saves me a lot of time. I no longer need to spend hours creating lesson plans from scratch. The automatic grading feature also reduces the time I spend marking students' work."

Another teacher, P, explained:

> "Teachy automates several tasks like lesson planning and assessment, which saves a lot of time."

Observations confirmed that teachers using Teachy delivered lessons more efficiently and relied heavily on platform-generated instructional materials. These materials were structured, aligned with curriculum goals, and easily customisable, which made planning smoother and less time-consuming.

1.2. ***Positive Emotional Response***

Teachers expressed emotional relief and satisfaction from using Teachy. They described feeling less overwhelmed and more confident in handling their workload. YL stated,

> "Teachy has helped streamline my workload, making my job less stressful and more enjoyable."

P echoed this sentiment, sharing,

> "Previously, I spent hours preparing lesson plans and assessments. Now, with Teachy, I can accomplish these tasks in a fraction of the time, which has made my job much more manageable."

Despite these benefits, not all teachers found the transition easy. YL confessed,

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> "At first, I was sceptical about using Teachy because I was used to my traditional methods. It took time for me to feel comfortable relying on an AI-powered platform."

Similarly, AM noted how technical challenges interrupted their workflow:

> "Teachy is a great tool, but sometimes internet connectivity issues disrupt the workflow, making it difficult to use consistently."

This combination of emotional relief and initial anxiety reflected a common pattern: positive long-term attitudes emerged once teachers overcame their early resistance.

***3.3.*** Cognitive Shifts in Planning

Teachers underwent a cognitive shift in how they designed instruction and made pedagogical decisions. Teachy influenced the way they thought about planning and formative assessment.

YL shared,

> "Initially, I followed the standard approach to lesson planning, but Teachy provided AI-generated structures that made me reconsider how I organise learning objectives and assessments."

P discussed how Teachy changed her assessment practices:

> "Before using Teachy, I manually assessed student progress through traditional quizzes and written assignments. Now, with AI-based analytics, I can quickly identify learning gaps and tailor my instruction accordingly."

The integration process was not without difficulties. EL described the learning curve as,

> "...a mix of excitement and frustration…"

To manage this, teachers often turned to peer collaboration. AM admitted,

> "At first, I struggled with some features, but discussions with colleagues helped me understand how to integrate Teachy more effectively into my teaching."

Teachers shifted from linear, textbook-driven planning to competency-based lesson design aligned with Teachy recommendations.

2. Challenges

2.1. Changes in Pedagogical Practices

The adoption of Teachy also led to observable shifts in instructional strategies. Teachers moved toward more interactive, student-centred learning.

YL explained,

> "Now, I use the platform to generate lesson frameworks, which I then refine based on my students' needs. It has made my preparation more efficient and structured."

AM noted,

> "Teachy helps in creating various multimedia resources like quizzes and mind maps. My lessons have become more interactive because I can provide digital activities that engage students beyond textbooks."

P highlighted how Teachy enabled differentiated learning:

> "With Teachy, I can immediately see which students are struggling with specific topics. This allows me to adjust my approach and provide additional support where needed."

EL observed that students became more independent:

> "My students now take more initiative in their learning because they receive instant feedback… they can self-assess and make improvements on their own."

### 2.2. Challenges and Barriers to Implementation

Digital literacy, inadequate training, and infrastructure issues were significant challenges. EL said,

> "At first, I had trouble understanding how to navigate Teachy's features. I had to rely on trial and error, and it took time before I felt comfortable using it in my lessons."

EL also pointed out the lack of support:

> "We were given access to the platform, but proper training was not provided. Many teachers had to learn independently, which was difficult for those who were less familiar with digital tools."

YL discussed the issue of digital access,

> "Not all schools have stable internet access or sufficient devices for students. Sometimes, I have to print materials because not all my students can access Teachy from home."

P summed up the reluctance to change:

> "I've been teaching for years using traditional methods. Relying on AI felt unnatural at first, and I was unsure if it could truly replace my way of teaching."

### 2.3. Leadership *Support in Digital Transformation*

Support from school leaders played a pivotal role in successful Teachy adoption. P noted,

> "When school leaders actively promote the use of Teachy and provide workshops, teachers feel more confident in using the platform."

In schools with ongoing support and encouragement, teachers reported feeling empowered and motivated to explore new digital tools.

YL added,

> "In my school, there is a strong push for technology integration, and because of that, we receive regular training and support, which makes it easier to adapt."

### 2.4. Teachers' Collaboration in Using Teachy

Peer collaboration was a strong facilitator for Teachy adoption. Teachers supported each other by sharing resources and discussing best practices.

P shared,

> "I initially struggled with some of Teachy's features, but having colleagues who were already familiar with it made a big difference."

EL emphasized,

> "We often discuss best practices and troubleshoot problems together. This helps us all use Teachy more effectively and ensures that no one is left behind."

YL observed,

> "Before Teachy, I had to create lesson plans entirely from scratch. Now, I can access shared templates, adapt them to my needs, and even share my own resources with colleagues."

### 2.5. Implementation and Sustainability

Although Teachy showed potential, issues of sustainability and policy-practice gaps emerged. YL shared,

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> "In my school, the internet connection is unreliable, which disrupts the use of Teachy in the classroom. Sometimes, I have to revert to manual lesson planning because the system won't load."

AM pointed out disparities in digital access:

> "Not all students have personal gadgets or computers at home. This makes it hard to assign digital-based tasks because not everyone can complete them outside of school."

P added a concern about resistance:

> "Some of my colleagues are reluctant to use Teachy because they feel more comfortable with their conventional ways of teaching."

Overal, the eight themes identified in this study are closely interconnected and provide a comprehensive picture of how teachers experienced the integration of Teachy in their instructional practices. The benefits, such as reduced workload, emotional relief, and cognitive shifts in planning, were strengthened by supportive contextual factors, including leadership encouragement and peer collaboration. However, these advantages were also shaped by each school's unique context and were moderated by challenges such as infrastructure limitations, varying levels of digital literacy, and resistance to change. The consistency of these themes across participants indicates that the patterns observed in this study are robust and reflect the realities of Teachey's implementation within the participating schools.

## Discussion

This study explored how junior high school teachers used Teachy, how the platform influenced their workload and pedagogical practices, and what contextual factors shaped their experiences. The findings addressed these questions by revealing (a) notable reductions in administrative workload, (b) meaningful cognitive and pedagogical shifts, and (c) substantial contextual constraints that moderated adoption. The results not only confirm the potential of AI-based tools in supporting teachers' work but also expose persistent challenges that complicate their sustainable use, especially in under-resourced environments.

### *The Role of Teachy in Assisting Teacher Workload*

The results reaffirm the potential of Teachy to ease administrative burdens—an outcome consistent with Talwar (2023) and Weissenfels et al. (2021). However, this study also uncovered an unexpected nuance: although all teachers reported workload reduction, the *magnitude* of relief differed based on infrastructure quality, digital literacy, and school support. Teachers in better-resourced schools benefited more fully, whereas those in rural or low-connectivity areas continued to face bottlenecks that counteracted the platform's advantages.

In line with Activity Theory (Engeström, 2014), Teachy served as a mediating artefact within the teaching activity system, modifying both the structure and execution of daily teaching practices. By enabling more efficient workflow, Teachy

acted not only as a technological support tool but also as an agent of pedagogical transformation.

### *Emotional and Psychological Impact of Teachy Use*

Emotional relief was closely tied not only to reduced workload but also to teachers' confidence in navigating digital tools. Positive emotions, such as increased satisfaction and reduced stress, appeared to be strong predictors of sustained platform use. This supports the findings of Moldavan et al. (2022) and Ma & Liu (2024) but extends them by showing that emotional responses varied according to school context.

Notably, anxiety and initial resistance persisted longer among teachers with limited technological experience. Even when workload decreased, some teachers continued to feel uncertain, suggesting a tension between perceived usefulness and perceived self-efficacy. This emotional dimension remains underexplored in AI-in-education research and adds a meaningful psychological layer to technology acceptance models.

### *Cognitive Shifts and Professional Adaptation*

Teachers' cognitive processes evolved as they engaged with Teachy's automated planning structures and analytics. This included shifts from linear lesson design to more adaptive, data-informed planning, aligning Alemdag et al. (2020) and Fernández-Batanero et al. (2022). However, teachers differed in the depth of cognitive transformation. More experienced teachers often retained traditional approaches and used Teachy only for supplementary tasks, while younger teachers adopted more innovative practices.

This variation suggests that cognitive adaptation is shaped not only by the platform's capabilities but also by pedagogical beliefs and years of teaching experience. The findings therefore, refine existing frameworks by demonstrating that AI-mediated cognitive shifts are not uniform across users.

### *Pedagogical Innovations and Student-Centred Learning*

The implementation of Teachy contributed to meaningful pedagogical change. The platform supported a transition from teacher-centred to student-centred learning by providing digital content, real-time feedback, and formative assessments. These findings are consistent with studies by Christopoulos & Sprangers (2021), which highlighted that educational technologies enable differentiated instruction and encourage greater student autonomy.

Teachers in this study embraced AI-informed lesson plans and assessment tools to personalise instruction, promote independent learning, and track student progress. Such practices aligned with constructivist and formative assessment theories, suggesting that Teachy not only supported workload management but also facilitated instructional quality improvement.

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### *Barriers to Implementation and Institutional Constraints*

Despite its benefits, Teachy's implementation was hindered by significant challenges, particularly concerning digital infrastructure and teacher preparedness. Similar to findings by Nurhidayat et al. (2024), the present study found that inadequate internet access and limited availability of devices constrained the consistent use of the platform. Furthermore, the absence of formal training programs left teachers to learn Teachy through informal means, exacerbating the adoption gap among those with limited technological proficiency.

Institutional barriers, including a lack of leadership support and resistance to pedagogical change, also emerged. These challenges echoed the concerns of DeMatthews et al. (2021) and Quickfall & Wood (2024), who identified workload-related burnout and leadership disengagement as major factors in ineffective technology integration.

### *Leadership Support and Collaborative Culture*

Strong leadership support and school-wide collaboration were identified as critical enablers of successful Teachy adoption. Schools that actively promoted digital literacy, provided structured professional development, and fostered collaborative teacher communities saw higher levels of platform engagement. These findings are aligned with the work of Fernández-Batanero et al.,(2022) and Agung et al.,(2024), who highlighted the importance of leadership and school culture in promoting educational innovation.

Peer support mechanisms also played a vital role in overcoming early-stage challenges, particularly for less digitally proficient teachers. Shared resources, team teaching, and digital communities created a culture of mutual assistance that supported long-term sustainability.

### *Implementation Gaps and Sustainability Issues*

Although national and school-level policies increasingly promote the use of AI tools in education, this study revealed a mismatch between policy intentions and real classroom conditions. In many schools, particularly in rural areas, the absence of concrete implementation plans, monitoring systems, and long-term support structures undermined the sustained use of Teachy. These gaps mirror earlier critiques by Perryman & Calvert (2020) and Ismandra et al. (2025), who warned of the risks of top-down technology mandates without grassroots-level readiness.

Sustainable integration of platforms like Teachy requires not only initial enthusiasm but continuous investment in infrastructure, training, and supportive leadership. Without these, AI tools risk becoming underutilised or misaligned with actual teaching needs.

## Conclusion

This study has shown that the Teachy platform, when integrated into Indonesian public-school settings, has the potential to reduce administrative burdens and enhance pedagogical practices. Teachers reported improved focus on student engagement and more efficient lesson planning and assessment processes. However, these findings are context-specific and should be interpreted cautiously. The study was limited to a single school and employed a qualitative approach, which restricts the generalizability of the results. Differences in digital literacy, infrastructure availability, and institutional support further influenced the extent of the platform's adoption.

Given these limitations, several practical recommendations can be made. School leaders should priorities structured digital training and ongoing mentoring to support the integration of AI-based tools. Teachers are encouraged to participate in peer learning and collaborative experimentation with platforms like Teachy to support their professional growth. Policymakers must align digital education strategies with investments in infrastructure and continuous professional development to ensure sustainable implementation.

Future research should explore the long-term effects of AI integration on both teaching practices and student learning outcomes. Comparative studies across diverse school contexts, such as urban and rural settings, are crucial for identifying context-sensitive challenges and effective implementation strategies. Employing mixed-method designs could also offer a more comprehensive perspective on the role of AI in education.

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