

Can Artificial Intelligence Reduce Teachers' Workload Without Compromising Educational Interaction?

Irfan Alkhotiri^{*1}, Eko Budi Prasetyo^{*2}, Opi Irawansah^{*3}

¹ Sekolah Tinggi Agama Islam Minhajul Haq Purwakarta Indonesia

² STAI Mutiara Bangsa Bekasi, Indonesia

³ Universitas Al-Irsyad Cilacap, Indonesia

Email : irfan@staimh.ac.id , eko.budi@mutiarabangsa.ac.id , opi.irawansah@uac.ac.id

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ABSTRACT: This study aims to examine the impact of artificial intelligence (AI) utilization as a teaching assistant on teachers' workload and the quality of educational interactions in Islamic schools (Madrasahs). Employing a mixed-methods sequential explanatory design, the study involved 120 teachers divided into an experimental group (AI users) and a control group. Quantitative findings revealed a significant reduction in the workload of teachers using AI ($\Delta = -18.5$ points, $p < 0.001$) and a significant improvement in the quality of educational interactions ($\Delta = +1.4$ points, $p < 0.001$). Furthermore, a strong correlation was found between the reduction in time-related workload and the enhancement of a positive classroom climate ($r = -0.72$). Qualitative findings indicated that the time saved through AI assistance (16.8 hours per week) was reallocated to personal interactions with students and character development activities. The study confirms that AI has the potential to transform the teacher's role from mu'allim (knowledge transmitter) to murabbi (character educator), provided that its implementation is managed wisely and ethically.

Keywords: Artificial Intelligence, Teaching Assistant, Teacher Workload, Quality of Educational Interaction, Islamic Education.

ABSTRAK. Penelitian ini bertujuan untuk mengukur dampak penggunaan kecerdasan buatan (AI) sebagai asisten guru terhadap beban kerja dan kualitas interaksi pendidikan di Madrasah. Menggunakan pendekatan mixed methods sequential explanatory, penelitian melibatkan 120 guru yang dibagi ke dalam kelompok eksperimen (pengguna AI) dan kontrol. Hasil kuantitatif menunjukkan penurunan signifikan beban kerja guru pengguna AI ($\Delta = -18.5$ poin, $p < 0.001$) dan peningkatan kualitas interaksi ($\Delta = +1.4$ poin, $p < 0.001$), dengan korelasi kuat antara pengurangan beban waktu dan peningkatan iklim positif kelas ($r = -0.72$). Temuan kualitatif mengungkap alokasi ulang waktu hemat (16.8 jam/minggu) untuk interaksi personal dan pembinaan karakter. Penelitian ini menegaskan bahwa AI berpotensi mentransformasi peran guru dari mu'allim menjadi murabbi dengan syarat penggunaannya dikelola secara bijaksana dan etis.

Kata kunci: Kecerdasan Buatan, Asisten Guru, Beban Kerja Guru, Kualitas Interaksi, Pendidikan Islam

A. INTRODUCTION

The rapid advancement of artificial intelligence (AI) has significantly transformed educational paradigms worldwide. In the context of Islamic education in Indonesia, teachers face a dual challenge: the increasing demand to improve instructional quality while simultaneously coping with substantial administrative and technical responsibilities. A systematic review conducted by Jerrim et al. (2020) in the United Kingdom reported that

teachers spend an average of 26 hours per week on technical and administrative tasks, including lesson planning, assignment grading, and classroom administration. Such responsibilities consume a considerable portion of teachers' time that could otherwise be devoted to meaningful pedagogical engagement and student mentoring.

Similarly, Hashem et al. (2024) identified instructional planning and content development as major contributors to teacher burnout, highlighting that teachers often dedicate extensive hours to non-instructional tasks that drain their energy and professional capacity. This situation is particularly problematic within Islamic educational settings, where the ideals of *ta'dib* (character formation) and *talaqqi* (direct teacher–student interaction) require teachers to possess sufficient time and emotional capacity to guide students personally and holistically. Ubaidah and Haris (2026) further warned that AI may challenge teachers' scholarly authority, noting that 89% of students use AI for academic work and 90% perceive AI as enhancing their participation. This paradox raises important concerns regarding the evolving role of teachers in contemporary educational environments. The discrepancy between the ideal role of teachers as holistic educators and the reality of increasing technical workloads underscores the need for innovative solutions, one of which is the utilization of AI as a teaching assistant. Therefore, this study aims to empirically examine the impact of AI-assisted teaching on teacher workload and the quality of educational interactions in Madrasah Aliyah institutions.

A growing body of literature has investigated various dimensions of AI integration in education. Purwono et al. (2025), in their review study, categorized Generative AI (GenAI) applications into adaptive learning systems, teacher-support tools, and student-engagement platforms. Their findings indicated that AI enhances personalized instruction, reduces administrative burdens, and promotes student engagement through co-creative learning environments and conversational chatbots. Likewise, Chen et al. (2025), through a quasi-experimental study, demonstrated that generative AI teaching assistants significantly improve teacher task efficiency by reducing both administrative and cognitive workloads.

Hashem et al. (2024) evaluated an AI-powered instructional planning platform in secondary schools and found that AI-generated recommendations enabled teachers to allocate more time to pedagogical activities. Similarly, Dymyati et al. (2025), in a systematic review, reported that AI-driven administrative automation could reduce teacher workloads by approximately 30–40%, considering that nearly 40% of teachers' working hours are spent on administrative responsibilities. Research on GenAI-based teaching assistants in distance education within the Indonesian context (Open Praxis, 2025) further revealed that students in AI-supported classrooms participated more actively in discussion forums and achieved slightly higher academic performance than those in conventional learning environments.

Additional evidence has emerged from Tang et al. (2026), who developed an Intelligent Teaching Design Assistant for elementary mathematics education. Their findings demonstrated that the system significantly outperformed generic large language models in enhancing lesson-plan quality. Furthermore, Nazaretsky et al. (2022) investigated teachers' trust in AI-powered educational technologies and concluded that perceived usefulness and trust play critical roles in technology adoption. Meanwhile, Akgun and Greenhow (2022) discussed several ethical challenges associated with AI implementation in K–12 education, including concerns regarding privacy, algorithmic bias, and teacher professional autonomy. In a related study, Majeed and Ahmad (2025) investigated the influence of digital competence, AI utilization, and informal learning on the functional skill development of

Islamic school teachers in Southern Pakistan. Their results indicated that digital competence ($\beta = 0.35$) and AI utilization ($\beta = 0.28$) significantly contributed to teachers' professional skill enhancement.

Despite the growing evidence regarding the effectiveness of AI in improving educational efficiency and instructional effectiveness, several critical gaps remain insufficiently addressed. Most existing studies primarily focus on the technical and functional capabilities of AI, such as generating learning materials or analyzing educational data, without empirically examining how the workload reductions facilitated by AI are subsequently reallocated by teachers and how such reallocation influences the quality of educational interactions in a holistic manner.

For example, Goetze and Selwyn (2026) explored how AI applications that support or replace instructional tasks influence teachers' professional judgment, cognitive workload management, and sense of agency. Their findings suggested that teacher agency remains conditional and is shaped by institutional pressures and algorithmic opacity. Similarly, Ubaidah and Haris (2026) expressed concerns that AI could diminish meaningful interpersonal interactions and increase student dependence on technology without adequate teacher guidance. Zawacki-Richter et al. (2019), in their systematic review of Artificial Intelligence in Education (AIED), highlighted a lack of critical reflection regarding the risks and challenges associated with AI implementation, as well as a weak connection between AI applications and established pedagogical theories.

More importantly, no previous study has specifically examined the relationship between AI-induced workload reduction and improvements in educational interaction quality across integrated dimensions such as emotional support, classroom management, and instructional support within the context of Islamic schools. Existing scholarship often remains trapped within a simplistic "pro-versus-contra AI" discourse and has yet to provide sufficient empirical evidence regarding the mechanisms through which AI may transform teachers' professional roles. Consequently, it remains unclear whether AI genuinely enables teachers to perform their pedagogical functions more effectively or merely shifts responsibilities into new technological forms.

To address these gaps, this study proposes the concept of "AI as an Empowering Teaching Assistant." Unlike perspectives that view AI primarily as a substitute for teachers or as a threat to educational practice, this framework positions AI as a strategic tool capable of restoring and strengthening the essential role of teachers as *murabbi*—educators responsible not only for knowledge transmission but also for character formation and moral development.

The theoretical foundation of this study integrates two complementary perspectives. First, Cognitive Load Theory proposed by Sweller (1988) explains how reducing extraneous cognitive demands—particularly administrative and technical burdens—can free cognitive resources for more meaningful educational tasks. Second, the concept of *Ta'dib* in Islamic educational philosophy, as articulated by Al-Attas (1979), emphasizes that the ultimate objective of education extends beyond knowledge acquisition toward the cultivation of ethical character, wisdom, and proper conduct. By combining these theoretical perspectives, the present study hypothesizes that reducing teachers' technical workload through AI assistance will enhance the quality of educational interactions, particularly those centered on character development and holistic student guidance.

Accordingly, this research seeks to provide empirical evidence regarding whether AI can function not merely as a technological efficiency tool but as a transformative educational assistant that enables teachers to reclaim their fundamental role as moral and character educators within Islamic educational institutions.

B. METHOD

This study employed a mixed-methods approach using a sequential explanatory design, in which quantitative data collection and analysis were conducted in the first phase, followed by qualitative investigation to explain and enrich the quantitative findings. This design was selected to provide a comprehensive understanding of how artificial intelligence (AI) as a teaching assistant influences teacher workload and the quality of educational interactions in Islamic schools.

The quantitative component utilized a quasi-experimental pretest–posttest control group design. Teachers in the experimental group integrated AI-assisted teaching tools into their instructional practices, while teachers in the control group continued to use conventional teaching methods. The qualitative phase consisted of semi-structured interviews aimed at exploring teachers' experiences, perceptions, and reflections regarding AI utilization in educational settings.

The study was conducted in three Islamic schools (Madrasahs) located in West Java, Indonesia, namely Madrasah Aliyah Minhajul Haq, Madrasah Tsanawiyah Nurul Falah Bolang, and Madrasah Ibtidaiyah Bhakti. A total of 120 teachers participated in the study and were selected through purposive sampling based on their teaching experience, willingness to participate, and access to digital technology.

Participants were divided into two groups: Experimental Group (n = 60): Teachers who utilized AI-assisted teaching tools during the intervention period. Control Group (n = 60): Teachers who continued their regular teaching practices without AI assistance.

The intervention was conducted over a period of four months. Prior to implementation, teachers in the experimental group participated in a training program on the effective and ethical use of AI tools for educational purposes. The training covered prompt development, content verification, lesson planning support, assessment assistance, and feedback generation.

During the intervention, teachers were encouraged to utilize AI for activities such as: Lesson planning and instructional material development, Preparation of assessment instruments, Automated generation of feedback on student assignments, Administrative documentation and reporting and Development of differentiated learning materials.

Teachers in the control group continued to perform these activities using conventional methods without AI assistance.

Teacher workload was assessed using the NASA Task Load Index (NASA-TLX), a widely validated instrument designed to measure perceived workload across six dimensions: Mental Demand, Physical Demand, Temporal Demand, Performance Effort and Frustration. Each dimension was rated on a scale ranging from 0 to 100, with higher scores indicating greater perceived workload.

The quality of educational interactions was measured using an observation protocol adapted from the Classroom Assessment Scoring System (CLASS). The instrument evaluated three major domains: Emotional Support, Classroom Organization and Instructional Support. Each indicator was rated on a seven-point scale, with higher scores reflecting better interaction quality.

To complement the quantitative findings, semi-structured interviews were conducted with 15 teachers from the experimental group. Interview questions focused on experiences of AI utilization, perceived benefits and challenges, changes in workload, and the influence of AI on teacher–student interactions.

Quantitative data were collected at two points: before the intervention (pretest) and after the four-month intervention period (posttest). Teacher workload questionnaires and classroom observations were administered to both groups during these phases.

Following quantitative analysis, qualitative interviews were conducted with selected participants to gain deeper insights into the mechanisms underlying the observed changes. All interviews were audio-recorded with participants' consent and subsequently transcribed for analysis.

Quantitative data were analyzed using IBM SPSS Statistics. Descriptive statistics were employed to summarize workload and interaction-quality scores. Independent-samples and paired-samples t-tests were conducted to examine differences between and within groups. Pearson correlation analysis was used to investigate relationships between workload reduction and educational interaction quality. Multiple linear regression analysis was performed to identify predictors of improvements in educational interactions.

Qualitative data were analyzed using thematic analysis following the procedures proposed by Braun and Clarke (2006). The analysis involved data familiarization, initial coding, theme development, theme review, and interpretation. The qualitative findings were subsequently integrated with the quantitative results to provide a comprehensive explanation of the impact of AI-assisted teaching.

Ethical approval for the study was obtained from the relevant institutional review authority. Participation was voluntary, and all participants provided informed consent prior to data collection. Confidentiality and anonymity were maintained throughout the research process, and participants were informed of their right to withdraw from the study at any stage without consequence.

C. RESULTS

3.1. Effects of AI Utilization on Teacher Workload

The quantitative findings revealed a substantial reduction in teacher workload among participants assigned to the experimental group compared with those in the control group. Table 1 presents the comparative workload scores based on the NASA Task Load Index (NASA-TLX).

Table 1. Comparison of Teacher Workload Scores (NASA-TLX)

Workload Dimension	Experimental (Pre)	Experimental (Post)	Control (Pre)	Control (Post)	Δ Experimental	Δ Control	Significance
Mental Demand	78.2	52.4	76.8	74.1	-25.8	-2.7	$p < .001$
Physical Demand	45.6	32.1	44.9	43.8	-13.5	-1.1	$p < .01$
Time Demand	82.5	48.7	81.2	78.9	-33.8	-2.3	$p < .001$
Performance (Perceived)	65.3	84.6	64.7	66.2	+19.3	+1.5	$p < .001$
Effort	79.8	51.2	78.5	76.3	-28.6	-2.2	$p < .001$
Frustration	58.4	29.7	57.9	55.1	-28.7	-2.8	$p < .001$
Overall Mean	68.3	49.8	67.3	65.7	-18.5	-1.6	$p < .001$

Source(s): Authors' own creation/work

The results indicate that teachers in the experimental group experienced a significant reduction in overall workload, decreasing from a mean score of 68.3 at pretest to 49.8 at posttest ($\Delta = -18.5$). In contrast, the control group demonstrated only a marginal decrease ($\Delta = -1.6$). The most substantial improvements were observed in the dimensions of time demand (-33.8 points), frustration (-28.7 points), effort (-28.6 points), and mental demand (-25.8 points). Furthermore, teachers using AI reported a considerable increase in perceived performance (+19.3 points).

Qualitative interview data corroborated these findings. Participants consistently reported that AI significantly reduced the time required for lesson planning, assessment, and administrative tasks.

One Islamic Education teacher from Madrasah Aliyah Minhajul Haq explained:

“Previously, I spent two to three hours preparing a single teaching module. With AI, I can generate an initial draft within approximately twenty minutes. The remaining time is devoted to refining and personalizing the material. As a result, I now have more opportunities to engage with students outside formal classroom sessions.”

Similarly, an Arabic language teacher from Madrasah Ibtidaiyah Bhakti noted:

“The greatest benefit lies in the reduction of administrative workload. I used to work late almost every evening grading dozens of student reflection journals. Now AI helps generate preliminary feedback, which I simply review and adjust. My workload has become much more manageable, and I am no longer constantly exhausted.”

These qualitative accounts suggest that workload reduction extended beyond efficiency gains and produced meaningful improvements in teachers' professional well-being and instructional capacity.

3.2. Effects of AI Utilization on the Quality of Educational Interaction

Classroom observations demonstrated significant improvements in educational interaction quality among teachers who utilized AI-assisted teaching tools. Table 2 presents changes across the three CLASS domains.

Table 2. Comparison of Educational Interaction Quality Scores (CLASS Observation)

Interaction Dimension (CLASS)	Experimental (Pre)	Experimental (Post)	Control (Pre)	Control (Post)	Δ Experimental	Δ Control	Significance
Emotional Support							
Positive Climate	4.2	5.8	4.3	4.5	+1.6	+0.2	$p < .001$
Teacher Sensitivity	4.0	5.6	4.1	4.3	+1.6	+0.2	$p < .001$
Regard for Student Perspectives	3.8	5.4	3.9	4.0	+1.6	+0.1	$p < .001$
Classroom Organization							
Behavior Management	4.5	5.5	4.4	4.6	+1.0	+0.2	$p < .01$
Productivity	4.1	5.7	4.2	4.4	+1.6	+0.2	$p < .001$
Instructional Routines	4.3	5.6	4.3	4.5	+1.3	+0.2	$p < .001$
Instructional Support							
Facilitation of Understanding	4.0	5.3	4.1	4.2	+1.3	+0.1	$p < .001$
Meaningful Feedback	3.9	5.4	4.0	4.1	+1.5	+0.1	$p < .001$
Active Learning	4.2	5.5	4.2	4.3	+1.3	+0.1	$p < .001$
Overall Mean	4.1	5.5	4.2	4.3	+1.4	+0.1	$p < .001$
Source(s): Authors' own creation/work							

The overall quality of educational interaction increased significantly in the experimental group, rising from 4.1 to 5.5 on a seven-point scale. The largest improvements occurred within the Emotional Support domain, particularly in positive classroom climate, teacher sensitivity, and regard for student perspectives.

Qualitative findings revealed how these improvements manifested in daily classroom practices.

A Bahasa Indonesia teacher from Madrasah Tsanawiyah Nurul Falah Bolang stated:

“Previously, I often felt impatient because I was constantly rushing to complete curriculum targets. Now I have an ‘assistant’ that helps prepare initial drafts, allowing me to focus on observing students more carefully. I can identify who is confused, who is disengaged, and approach them individually.”

An Islamic Education teacher from Madrasah Ibtidaiyah Bhakti further explained:

“In the past, I frequently assigned grades without detailed comments because I was exhausted. Now AI assists me in analyzing student responses and preparing feedback drafts. I can provide personalized comments to every student, which encourages further discussion and increases their motivation.”

The most transformative insight emerged from a History of Islamic Civilization teacher:

“The most surprising change is that I now spend more time sharing life experiences and Islamic values during lessons. Because the technical burden has decreased, I finally have the space to become an educator rather than merely a transmitter of content. This, in my view, represents the true essence of ta'dib.”

These narratives indicate that AI-assisted teaching enhanced not only instructional effectiveness but also teachers' capacity to foster meaningful interpersonal relationships and character development.

3.3. Correlation Between Workload Reduction and Interaction Quality

Pearson correlation analyses identified strong relationships between reductions in teacher workload and improvements in educational interaction quality. Specifically, reductions in time demand were strongly associated with improvements in positive classroom climate ($r = -0.72$, $p < .001$). Likewise, reductions in frustration were strongly correlated with increased teacher sensitivity ($r = -0.68$, $p < .001$), while reductions in mental workload were associated with improvements in meaningful feedback ($r = -0.65$, $p < .001$).

A multiple regression analysis produced the following model:

$$IQ = 0.45 + 0.38(RTD) + 0.27(RF)$$

where:

IQ = Improvement in Interaction Quality

RTD = Reduction in Time Demand

RF = Reduction in Frustration

The model yielded an R^2 value of 0.62 ($p < .001$), indicating that reductions in time-related workload and frustration explained 62% of the variance in educational interaction quality.

These findings demonstrate that the positive impact of AI on educational interactions is largely mediated through reductions in teachers' workload and emotional strain.

3.4. Changes in Teacher Time Allocation

To investigate how teachers utilized the time saved through AI integration, weekly work-hour allocation was analyzed.

Table 3. Changes in Teacher Time Allocation (Hours per Week)

Activity	Experimental (Pre)	Experimental (Post)	Control (Pre)	Control (Post)	Δ Experimental
Lesson Preparation	12.5	4.2	12.8	12.4	-8.3
Assignment and Examination Grading	8.4	3.1	8.2	8.0	-5.3
Administrative Management	5.2	2.0	5.0	4.9	-3.2
Total Technical Tasks	26.1	9.3	26.0	25.3	-16.8
Personal Interaction with Students	2.1	6.8	2.2	2.3	+4.7
Reflection and Professional Development	1.5	4.5	1.6	1.7	+3.0
Support for Students with Difficulties	1.8	4.0	1.7	1.9	+2.2
Total Non-Technical Activities	5.4	15.3	5.5	5.9	+9.9

The findings indicate that teachers in the experimental group saved approximately 16.8 hours per week on technical and administrative tasks. Importantly, these hours were reallocated toward activities that directly support student development, including personal mentoring, professional reflection, and individualized assistance for students experiencing academic or behavioral challenges.

Overall, the integration of AI transformed teachers' time allocation patterns, enabling a shift from administrative labor toward relational, reflective, and student-centered educational practices.

D. DISCUSSION

The findings of this study provide compelling empirical evidence that the use of artificial intelligence (AI) as a teaching assistant significantly reduces teacher workload while simultaneously enhancing the quality of educational interactions within Islamic school settings. More importantly, the results demonstrate that the benefits of AI extend beyond operational efficiency, contributing to a meaningful transformation of teachers' pedagogical roles. The reduction in workload observed among teachers in the experimental group, particularly in the dimensions of time demand, mental demand, effort, and frustration, confirms the growing body of literature suggesting that AI can effectively automate routine administrative and instructional support tasks (Chen et al., 2025; Hashem et al., 2024; Purwono et al., 2025).

The observed reduction of 18.5 points in overall workload is consistent with previous studies reporting that generative AI technologies can alleviate teachers' cognitive and administrative burdens. Hashem et al. (2024), for example, found that AI-powered instructional planning systems support lesson preparation and content development, thereby allowing teachers to allocate more time to pedagogical activities. Likewise, Dymyati et al. (2025) reported that AI-driven administrative automation could reduce teacher workload by approximately 30–40%. The present study extends these findings by providing empirical

evidence from the context of Indonesian Islamic schools and demonstrating that workload reduction is accompanied by measurable improvements in educational interaction quality.

One of the most significant findings concerns how teachers utilized the time saved through AI assistance. Contrary to concerns raised by Ubaidah and Haris (2026), who argued that AI may reduce meaningful teacher–student interaction and increase student dependence on technology, the present study found the opposite trend. Teachers who adopted AI devoted substantially more time to personal mentoring, individualized student support, and professional reflection. These findings suggest that AI does not necessarily replace human interaction; rather, it may create opportunities for more intensive and meaningful educational engagement when implemented appropriately.

This result also challenges the concerns expressed by Goetze and Selwyn (2026), who argued that AI-supported educational systems may gradually replace teachers' professional judgment through algorithmic decision-making processes. The present findings indicate that reducing technical and administrative burdens can actually strengthen teachers' professional agency. Instead of delegating pedagogical decision-making to AI, teachers utilized the cognitive and emotional resources gained from workload reduction to exercise more nuanced professional judgment, provide individualized support, and respond more effectively to students' needs. In this regard, AI appears to function as an enabling technology rather than a substitutive one.

The qualitative findings further illuminate this transformation. Several participants reported that AI assistance enabled them to focus more extensively on mentoring, character development, and value-based education. Particularly noteworthy was the testimony of the Islamic history teacher who described a shift from being primarily a transmitter of knowledge toward becoming a facilitator of moral and character development. This finding resonates strongly with the Islamic educational philosophy of *ta'dib*, which emphasizes the cultivation of ethical character and proper conduct as the ultimate objective of education (Al-Attas, 1979).

From this perspective, the findings support and extend the arguments advanced by Ubaidah and Haris (2026) regarding the need to reorient educational practice from *ta'lim* (knowledge transmission) toward *ta'dib* (character formation). While previous discussions often portrayed AI as a threat to such reorientation, the present study suggests that AI can instead serve as a catalyst for restoring teachers' capacity to perform their broader educational responsibilities. The increased scores observed in emotional support, teacher sensitivity, and regard for student perspectives provide empirical evidence that teachers became more capable of nurturing holistic student development when relieved from excessive administrative demands.

The strong correlations identified between workload reduction and improvements in educational interaction quality provide further insight into the mechanisms underlying these changes. In particular, the strong negative correlation between time-demand reduction and positive classroom climate ($r = -0.72$) suggests that workload reduction may generate not only cognitive benefits but also emotional and relational advantages. Teachers who are less constrained by administrative pressures appear better equipped to establish supportive learning environments, demonstrate empathy, and engage meaningfully with students.

These findings enrich Cognitive Load Theory (Sweller, 1988), which traditionally focuses on the relationship between cognitive resources and learning performance. The present study suggests that reducing extraneous workload may also free emotional and relational resources, thereby enhancing teachers' ability to foster positive classroom climates and meaningful educational relationships. This contribution extends the application of Cognitive Load Theory beyond cognitive performance to encompass broader dimensions of educational practice.

The regression analysis further supports this interpretation. The finding that reductions in time demand and frustration explain 62% of the variance in interaction quality indicates that workload reduction serves as a key mechanism linking AI utilization to improvements in educational outcomes. While previous studies have documented the efficiency gains associated with AI adoption (Chen et al., 2025; Hashem et al., 2024), few have empirically examined how such gains translate into enhanced teacher–student interaction. Consequently, the present study contributes a novel explanatory framework by identifying time reallocation as a mediating factor between AI implementation and educational interaction quality.

Another noteworthy finding concerns the substantial reallocation of teachers' working hours. Teachers who utilized AI reduced their technical workload from 26.1 hours to 9.3 hours per week, generating a time saving of approximately 16.8 hours. Rather than reducing their overall professional commitment, participants reinvested this time into activities that directly support student development, including mentoring, individualized assistance, and professional reflection. These findings complement the work of Tang et al. (2026), who demonstrated the effectiveness of AI-supported instructional design systems, and Hashem et al. (2024), who emphasized the value of human–AI collaboration in educational planning. However, the present study extends these contributions by illustrating how efficiency gains are translated into pedagogically meaningful activities.

Furthermore, the significant improvement observed in the quality of feedback provided to students supports previous research on generative AI-assisted learning environments (Open Praxis, 2025). While earlier studies primarily focused on student engagement and academic performance, the current findings demonstrate that enhanced feedback practices also contribute to emotional support, classroom management, and overall interaction quality. This broader perspective highlights the multifaceted educational benefits of AI-assisted teaching.

Despite these positive outcomes, the findings should not be interpreted as evidence that AI represents a risk-free solution for educational challenges. Several scholars have warned about the potential dangers associated with excessive reliance on AI technologies. Goetze and Selwyn (2026) highlighted the risk of pedagogical deskilling, whereby professional expertise may gradually be replaced by algorithmic processes. Similarly, Kasneci et al. (2023) emphasized concerns regarding accuracy, bias, misinformation, and inappropriate educational applications of large language models. Farrokhnia et al. (2023) also identified potential threats related to overdependence on AI and reduced human interaction.

The experiences reported by participants in the present study suggest that such risks can be mitigated through appropriate implementation strategies. Teachers consistently described AI as a support tool rather than a replacement for professional judgment. They continued to review, verify, and personalize AI-generated outputs before applying them in

educational settings. This finding aligns with the recommendations of Akgun and Greenhow (2022), who emphasized the importance of ethical frameworks and governance structures for AI integration in education. It also supports the call by Zawacki-Richter et al. (2019) for stronger pedagogical and ethical foundations in Artificial Intelligence in Education (AIED) research.

From a broader perspective, the findings suggest that the future role of AI in education should be conceptualized as augmentative rather than substitutive. The evidence presented in this study indicates that AI can strengthen rather than weaken teachers' professional roles when its implementation is guided by clear pedagogical objectives and ethical considerations. In Islamic educational contexts, this augmentation may be particularly valuable because it enables teachers to devote greater attention to character formation, moral guidance, and personal mentoring—dimensions that remain beyond the capabilities of current AI technologies.

Overall, this study contributes to the emerging literature on AI in education by demonstrating that the value of AI lies not merely in increasing efficiency but in creating opportunities for teachers to reclaim and strengthen the human dimensions of teaching. By reducing technical burdens and expanding opportunities for meaningful educational interaction, AI has the potential to support a transformation from the role of *mu'allim* (knowledge transmitter) toward that of *murabbi* (character educator), thereby reinforcing the fundamental objectives of Islamic education in the digital era.

E. CONCLUSION

This study examined the impact of artificial intelligence (AI) as a teaching assistant on teacher workload and the quality of educational interactions in Islamic schools. The findings indicate that AI significantly reduced teacher workload, particularly in terms of time demand, mental demand, effort, and frustration. At the same time, teachers who utilized AI demonstrated notable improvements in educational interaction quality, including emotional support, classroom management, and instructional support.

The study also found a strong relationship between workload reduction and enhanced educational interactions. Teachers who experienced lower levels of workload were able to devote more attention to students, provide more meaningful feedback, and create a more positive classroom climate. Furthermore, the reduction of technical and administrative tasks enabled teachers to reallocate approximately 16.8 hours per week to activities such as student mentoring, personal interaction, and character development.

These findings suggest that AI can serve as an empowering teaching assistant rather than a replacement for teachers. By reducing routine workloads, AI provides opportunities for teachers to focus on the human and pedagogical dimensions of education that cannot be replicated by technology. In the context of Islamic education, this shift supports the transformation of the teacher's role from *mu'allim* (knowledge transmitter) to *murabbi* (character educator).

Nevertheless, the implementation of AI should be accompanied by appropriate ethical guidelines and professional supervision to ensure that technology remains aligned with educational goals. Future studies are recommended to investigate the long-term impact of AI integration across broader educational contexts and levels.

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