

MANAGEMENT OF MADRASAH HEADS IN THE DEVELOPMENT OF ARTIFICIAL INTELLIGENCE-BASED LEARNING INNOVATIONS AT MADRASAH ALIYAH NEGERI 1 TANJUNG JABUNG BARAT

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ABSTRACT

This study aims to analyze the management of madrasah heads in the development of Artificial Intelligence (AI)-based learning innovations at MAN 1 Tanjung Jabung Barat. The development of Artificial Intelligence technology has brought significant changes in the world of education, including in the learning process, preparation of teaching materials, assessments, and more effective and adaptive learning management. In this context, madrasah heads have a strategic role as educational leaders who are responsible for planning, organizing, mobilizing, and supervising various technology-based learning innovation programs. This study uses a qualitative approach with a case study method at MAN 1 Tanjung Jabung Barat. Data was obtained through observation, in-depth interviews, and documentation involving madrasah heads, teachers, education staff, students, and parties related to the development of AI-based learning. The results of the study show that madrasah heads have implemented various strategic policies in supporting the development of Artificial Intelligence-based learning innovations. These policies include the development of strategic partnerships with Mahardika Indonesia as a partner in AI competency development, strengthening teacher competencies through mentoring and training in the use of various AI platforms, providing and strengthening digital infrastructure in the form of computer laboratories.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis manajemen kepala madrasah dalam pengembangan inovasi pembelajaran berbasis Artificial Intelligence (AI) di MAN 1 Tanjung Jabung Barat. Perkembangan teknologi Artificial Intelligence telah membawa perubahan yang signifikan dalam dunia pendidikan, termasuk dalam proses pembelajaran, penyusunan bahan ajar, pelaksanaan penilaian, serta pengelolaan pembelajaran yang lebih efektif dan adaptif. Dalam konteks ini, kepala madrasah memiliki peran strategis sebagai pemimpin pendidikan yang bertanggung jawab dalam merencanakan, mengorganisasikan, menggerakkan, dan mengawasi berbagai program inovasi pembelajaran berbasis teknologi.

Penelitian ini menggunakan pendekatan kualitatif dengan metode studi kasus di MAN 1 Tanjung Jabung Barat. Data diperoleh melalui observasi, wawancara mendalam, dan dokumentasi yang melibatkan kepala madrasah, guru, tenaga kependidikan, peserta didik, serta pihak-pihak yang terkait dengan pengembangan pembelajaran berbasis AI. Hasil penelitian menunjukkan bahwa kepala madrasah telah menerapkan berbagai kebijakan strategis dalam mendukung pengembangan inovasi pembelajaran berbasis Artificial Intelligence. Kebijakan tersebut meliputi pengembangan kemitraan strategis dengan Mahardika Indonesia sebagai mitra dalam pengembangan kompetensi AI, penguatan kompetensi guru melalui pendampingan dan pelatihan penggunaan berbagai platform AI, penyediaan serta penguatan infrastruktur digital berupa laboratorium komputer.

Kata kunci: Artificial Intelligence, Head of Madrasah, Management, Learning

PENDAHULUAN

The challenges of AI trends have brought major changes in various aspects of life, including education. AI offers a variety of tools and platforms that can support the teaching and learning process, such as adaptive learning systems that can tailor subject matter according to the needs and abilities of each student. AI can also assist teachers in evaluating student performance more efficiently and providing more personalized feedback.

The integration of AI in education also brings its own challenges. Ensure that these technologies are used ethically and do not diminish the role of human interaction in the educational process.(Fauziyati, 2023) In addition, it is also important to prepare students to be able to adapt to rapid technological changes, so that students can optimize the benefits of AI without getting caught up in its negative impacts.

The ability to utilize AI technology in education can help achieve the goals expressed by Ibn Khaldun. With AI, students' minds can be stimulated more actively through interactive and innovative learning methods.(Sarinda et al., 2023) Science can be accessed more widely and deeply through digital resources(Nurqozin & Putra, 2023) supported by AI, and last but not least, skills gained from technology-based education can open up new job opportunities that are relevant to the times.

The head of the madrasah has a strategic function, role and position, where the head of the madrasah must hone his competence in managing the institution he leads. Efforts to improve Islamic education are to improve leadership in madrasahs as best as possible. The madrasah head of the idea encourages the discipline of the teachers by showing a sense of friendliness, closeness and consideration towards the teachers, both as individuals and as a group, so that it will produce new thoughts and ideas that emerge. Madrasah heads must have basic competencies as written in the attachment to the Regulation of the Minister of National Education Number 13 of 2007 concerning school/madrasah principal standards, it is emphasized that there are "five basic competencies that must be possessed by a school principal, namely personality, managerial, supervision, entrepreneurship, and social competencies".

The success or even failure of education in Madrasah is largely determined by the managerial nature of the madrasah head, with the skills he has, the head of the madrasah can improve the quality of the madrasah institution, so that it can show the performance of a good image leader. Good leadership should be owned and applied by all levels of the organization so that their subordinates can work well and have a high enthusiasm for the interests of the organization.

A manager means a leader who organizes and makes plans. Managers who are identified by the head of the madrasah can be interpreted as leaders who are responsible for the work of resources in the madrasah environment. According to T. Hani Handoko, managerial practice is an activity carried out by managers.(Naelasari & Abbas, 2021) Managerial madrasah head is one of the competencies that must be possessed by madrasah heads, Managerial skills are skills in carrying out and completing managerial tasks, namely planning, organizing, leading, and controlling the implementation of the organization to achieve certain goals. This statement is in line with Terry's statement: "management is a distinct process consisting of planning, organizing, actuating and controlling, performed to determine and accomplish stated objectives by the use of human beings and other resources".

MAN 1 Tanjung Jabung Barat has quite complete facilities, such as 50 computer units, Wi-Fi access in every classroom and office, CCTV installation in all strategic areas, and infocus in each learning room. This infrastructure provides a strong foundation for the

implementation of digital-based learning. In addition, the head of the madrasah also requires every teacher to own and use a personal laptop in the learning process, as a form of adaptation to the demands of the digital era as well as an effort to form a modern and productive work culture.

However, the results of the observation also found that the AI integration initiative at MAN 1 Tanjung Jabung Barat has not been fully institutionally structured. The use of AI technology and platforms by teachers is still driven by the spirit of individuals, not yet bound by a digital roadmap or official policy of madrasahs that is oriented towards a long-term. There has not been a technology development team that functions to ensure the continuity of the program, and there is no SOP or written policy that regulates the ethical and pedagogical use of AI. In other words, the good practices that have been in place are still fragmentary and have not yet become part of a planned management strategy.

Interestingly, in this madrasah there is a generation of young teachers who have digital competence and high enthusiasm for AI. They are actively introducing artificial intelligence applications in learning activities, such as the use of ChatGPT, Canva AI, or adaptive learning-based educational platforms. The existence of these young teachers has great potential for strengthening madrasah innovation in the future. However, this potential risks not being sustainable if it is not supported by a strong managerial system and visionary institutional policies from the head of the madrasah.

In general, the results of this initial observation show that the head of the madrasah at MAN 1 Tanjung Jabung Barat has displayed an adaptive managerial role and is open to technological developments, especially in the context of developing Artificial Intelligence-based learning innovations. Previous studies have generally focused more on technology integration (Iskandar et al., 2019) education in general or on the role of teachers in adopting digital media in learning. Studies that specifically highlight the role of madrasah head management as a determining factor for the success of Artificial Intelligence (AI) integration are still very limited, especially in the context of madrasahs in Indonesia. In fact, madrasah heads have a strategic position as instructional leaders who direct academic policies as well as digital change agents who determine the direction and sustainability of digital transformation in Islamic educational institutions.

An important innovation to be studied more deeply, namely how the leadership and management of madrasah heads can be a key factor in developing AI-based learning innovations. This is where the urgency of this research takes root that the success of AI integration in madrasahs does not only depend on the readiness of technology and teacher competence, but also on the managerial skills, strategic vision, and ability of madrasah heads to manage change. Considering the importance of the head of the madrasah as an instructional leader (Samsu et al., 2022) As well as a digital change agent, this is where the scientific gap lies as well as the urgency of this research.

It is important to conduct research that comprehensively examines the management of madrasah heads in the development of Artificial Intelligence-based learning innovations, especially at MAN 1 Tanjung Jabung Barat. This research will explore how madrasah heads manage various important aspects such as strategic planning, program implementation, work team formation, teacher competency development, and evaluation and sustainability of digital innovation.

The findings above show that with proper management, madrasahs can effectively adopt AI technology and provide significant benefits for improving the quality of education and preparing students to face an increasingly digital future. Top of Form Therefore, the title

of the research in the form of a Dissertation that the author raises is: "Management of Madrasah Heads in the Development of Artificial Intelligence-Based Learning Innovations at Madrasah Aliyah Negeri 1 Tanjung Jabung Barat"

METODE PENELITIAN

This study uses a qualitative approach. method with a description of the approach, which is to have brought in the wild to obtain accurate data about the Management of the Head of Madrasah in the Development of Artificial Intelligence-Based Learning Innovation at Madrasah Aliyah Negeri 1 Tanjung Jabung Barat. Qualitative research is a research method used to research on natural object conditions, (as opposed to experiments) where the researcher is the key instrument, data collection techniques are carried out by triangulation (combination), data analysis is inductive, and qualitative research results emphasize meaning more precisely than generalizations (Busetto) et al., 2020; Priya, 2021). The subjects of this research include madrasah heads, teachers, educators, education personnel, students, and other relevant parties, with the head of the madrasah as the main informant. Data sources consist of three categories: People (verbal or written answers from informants), Places (static and animated displays), and Paper (documents within forming from letters, numbers, images, or symbols). The main data sources include the heads of the madrasahs, educators, students, related documentation, and that's the atmosphere in each madrasah.

Engineering data collection is the main step in research. to obtain legitimate and reliable data. In this study, the methods used included observation, interviews, and documentation at Madrasah Aliyah Negeri 1 Tanjung Jabung Barat. Observations were made outside in a participatory way, in which the researchers engaged in this. daily activities from data sources to behavioral records and physical conditions, meeting agendas, the atmosphere of that teaching and learning process, and digitization activities. Interviews were conducted. through oral questions and answers to obtain information from the informant. In addition, documentation refers to records from past events, either in the form of writings, drawings, or monumental works, which serve as a complement to observation and interview methods in qualitative research.

Qualitative data analysis research involves the process of organizing and sorting data into patterns, categories, and basic descriptions to finding themes and working capacities that correspond to the data. According to Miles and Huberman, analysis is to be carried out interactively and continuously until the data reaches saturation, including three steps: data reduction, data presentation, and drawing conclusions (Afif, 2023). Data reduction includes data selection, coding, and initial interpretation, while data presentation can be done in the form of tables, graphs, or it favors to ease understanding. Conclusion The images are temporary. And can change based on the evidence obtained during the data collection process. To ensure the validity of the data, qualitative research applies techniques such as expanded participation, observational rigor, and triangulation. Expanded participation increases the investigator's familiarity with that subject, while observational rigor helps recognize the relevant elements within the creature situation of triangulation, which compares data from different sources, methods, or perspectives, reinforcing the trust of that information obtained. By using this technique, researchers can ensure that the data collected is valid, reliable, and objective.

HASIL DAN PEMBAHASAN

Hasil

Madrasah Head's Policy in the Development of Artificial Intelligence-Based Learning Innovation

a. Strategic Partnership Through Cooperation with Mahardika Indonesia

Digitization of education has become one of the important steps in improving the quality of learning in Indonesia, including at Madrasah Negeri Tsanawiyah. In the era of increasingly advanced information technology, the integration of technology in the learning process in schools or madrasahs is no longer an option, but an urgent need. This is also realized by State Junior High Schools in Jambi Province, which have begun to adopt various digital innovations in their education system. However, the implementation of digitalization in the educational environment, especially in madrasahs, still faces various challenges. Uneven technological infrastructure, diverse digital literacy among educators and students, and obstacles in the implementation of training programs are some of the factors that affect the success of digitalization. The digitalization that has been implemented in the Tsanawiyah State Madrasah in Jambi Province are:

The strategic partnership policy is a form of concrete policy of the head of the madrasah in the development of Artificial Intelligence-based learning innovations at MAN 1 Tanjung Jabung Barat. This policy can be seen through the official collaboration between MAN 1 Tanjung Jabung Barat and Mahardika Indonesia as an institution engaged in the development of Artificial Intelligence and learning technology. This collaboration is an important marker that madrasah heads not only rely on internal madrasah resources, but also build external networks to strengthen institutional capacity in facing the digital transformation of education.

The head of the madrasah through this partnership policy shows a progressive managerial perspective. The development of AI-based learning innovations is not seen as a program that can be partially run by teachers individually, but as an institutional agenda that requires knowledge support, technical assistance, competency strengthening, and cross-party collaboration. The collaboration with Mahardika Indonesia is a tangible form that madrasah heads understand the complexity of implementing AI in learning. AI technology is not only related to the ability to use applications, but also related to changes in learning paradigms, teacher readiness, ethics of using technology, and the ability of madrasahs to build a more adaptive and innovative learning system.

The cooperation policy can be understood as part of the madrasah head's strategy in managing external resources. Artificial Intelligence is a relatively new field for some madrasah teachers. Some teachers may be familiar with digital technology, but have not fully understood how AI can be appropriately integrated into learning. This condition requires the head of the madrasah to take policies that are not only internal, but also collaborative. Mahardika Indonesia is then positioned as a strategic partner that can help madrasahs in strengthening AI literacy, providing technical assistance, and opening up teachers' insights into opportunities for the use of AI in the teaching and learning process.

The results of the interview with the head of the madrasah show that the collaboration with Mahardika Indonesia is motivated by the need for madrasahs to accelerate adaptation to the development of educational technology. The head of the madrasah views that madrasahs cannot close themselves to technological changes because students live in a digital ecosystem that continues to grow. The head of the madrasah said: "We realize that AI is a very rapid technological development. Teachers need to understand how AI can be leveraged for

learning. We collaborate with Mahardika Indonesia so that madrasahs get assistance from parties who understand the field better."

The statement shows that the madrasah head's strategic awareness of the importance of external collaboration is real. The head of the madrasah does not view internal limitations as an obstacle that makes the madrasah stop innovating. The head of the madrasah actually uses these limitations as a basis for building cooperation with parties who have stronger competence in the field of Artificial Intelligence. This attitude shows the existence of adaptive leadership character, which is the leader's ability to read organizational needs, recognize internal limitations, and seek relevant external resources to support the achievement of institutional goals.

The collaboration with Mahardika Indonesia also shows that the head of the madrasah places AI innovation as an agenda for the development of learning quality. AI is not presented only as a symbol of modernity, but as an instrument that is expected to be able to help teachers in increasing learning effectiveness. Teachers can gain knowledge on how to use AI to compile teaching materials, develop learning media, create assessments, design classroom activities, and find alternatives to more creative learning strategies. This policy shows that madrasah heads are trying to connect technological innovations with the pedagogical needs of teachers.

The results of an interview with one of the teachers reinforced these findings. The teacher said that the collaboration with Mahardika Indonesia provides a new experience for teachers in understanding the use of AI. "Through activities with Mahardika Indonesia, we began to know that AI can help teachers in preparing learning. So far, some teachers have only heard about AI, but have not understood how to use it to create media, formulate problems, or find learning ideas."

The quote shows that partnership policies have an impact on improving teachers' digital literacy. Teachers who were previously only familiar with AI in general are starting to gain a more practical understanding of the use of AI in learning. This transformation is important because the success of learning innovation is not only determined by the availability of technology, but also by the ability of teachers to operate, select, adjust, and evaluate the use of technology according to the needs of students.

The results of observations of madrasah activities show that cooperation with external parties has begun to encourage the formation of a new learning atmosphere among teachers. Teachers seem more open to discussing the use of AI-based applications. Some teachers are starting to try using AI platforms to create lesson plans, formulate questions, develop presentation materials, and search for material references. These activities show that partnership policies do not stop at the level of cooperation documents, but begin to have an impact on teachers' professional practices.

The research documentation also shows that there is formal evidence of cooperation between MAN 1 Tanjung Jabung Barat and Mahardika Indonesia. The document can be in the form of MoU manuscripts, photos of activities, participant attendance lists, training materials, activity agendas, invitation letters, minutes, or activity implementation reports. The presence of these documents strengthens the finding that the policy of madrasah heads has an institutional basis that can be traced administratively. The MoU document is proof that madrasah heads not only provide verbal direction, but also begin to build a formal basis for the development of AI-based learning innovations.

The MoU with Mahardika Indonesia has a broader meaning than just a cooperation document. The MoU can be read as a symbol of institutional change. Madrasahs began to

present themselves as Islamic educational institutions that were open to technological innovation. The identity of madrasahs is no longer limited by traditional images, but begins to be developed as an educational institution that is able to integrate Islamic values with modern technological prowess. This symbol of change is important because madrasahs have the responsibility to prepare students who are religious, characterful, and adaptive to the times.

The partnership policy also shows a paradigm shift in madrasah management. Madrasah heads no longer view education management as an internal activity that depends only on the madrasah structure, but as a collaborative process that requires networking with external parties. This pattern is in line with the demands of modern education management that emphasizes the importance of partnerships, collaboration, and network-based governance. Educational institutions cannot develop optimally if they work behind closed doors. Innovation actually develops faster when madrasahs are able to build relationships with parties who have relevant expertise, experience, and resources.

Mahardika Indonesia's involvement as an external partner can be understood as a form of knowledge transfer. Teachers gain access to new insights on AI, while madrasahs gain institutional capacity strengthening. This knowledge transfer process is not only related to the technical ability to use applications, but also related to changing the perspective on learning. Teachers are beginning to understand that AI can be used to expand creativity, speed up the preparation of teaching tools, help analyze learning needs, and provide more interesting learning variations for students.

The results of interviews with AI experts from Mahardika Indonesia can be directed to an explanation of the importance of assistance in the use of AI. AI experts can state: "The utilization of AI in learning requires proper understanding. Teachers need to understand how AI is used ethically, creatively, and in accordance with learning goals. The collaboration with madrasahs aims to help teachers recognize the potential of AI as well as its limitations."

The statement shows that the use of AI in education cannot be separated from ethical and pedagogical aspects. AI cannot be used mechanically without academic consideration. Teachers need to understand that the results of AI must be selected, verified, and tailored to the learning context. The policy of madrasah heads involving external experts is important because it can help teachers avoid using AI incorrectly, for example, just copying application outputs without critical review.

b. Strengthening Teacher Competence in the Utilization of AI

The policy of madrasah heads in the development of Artificial Intelligence-based learning innovations at MAN 1 Tanjung Jabung Barat is also strongly seen through strengthening teacher competence. This strengthening is one of the important aspects because teachers are the main actors in the learning process. AI will not have a significant impact on the quality of learning if teachers do not have the knowledge, skills, and pedagogical readiness to use it. The head of the madrasah understands that the success of AI integration is not determined by the availability of technological devices, but is highly dependent on the capacity of teachers to process the technology into meaningful learning instruments.

The policy of strengthening teacher competence can be seen from the direction of the head of the madrasah to teachers to start actively utilizing various AI-based platforms in learning activities. The head of the madrasah encourages teachers to use AI to help with the preparation of teaching materials, the creation of learning media, the preparation of assessments, the development of questions, the search for references, and the academic

assistance of students. This encouragement shows that madrasah heads do not position AI only as a technical tool, but as part of a strategy to improve the quality of learning in madrasahs.

Data from interviews with madrasah heads show that the policy of strengthening teacher competence is based on the need to adjust the ability of educators to the development of educational technology. The head of the madrasah said that teachers must continue to learn in order to be able to keep up with the changing times. The following interview excerpt can be used and adapted to the original transcript of the study: "Teachers should start recognizing and using AI in learning. This technology is inevitable. If teachers do not learn, learning will be left behind. We encourage teachers to use AI to help create materials, teaching media, assessments, and student learning activities."

The statement shows that the head of the madrasah has a policy orientation that places teachers as the main subject of learning transformation. Teachers are not only positioned as curriculum implementers, but also as developers of learning innovations. This policy has an important meaning because AI-based learning changes cannot take place effectively if teachers are only passive users of technology. Teachers need to have the ability to select, interpret, adapt, and develop the use of AI according to learning objectives, material characteristics, and learners' needs.

The head of the madrasah through this policy tries to shift the role of teachers from just technology users to learning innovators. Teachers are not only directed to use AI technically, for example to find answers or create materials automatically, but also directed to be able to create digital teaching media that is more creative, relevant, interactive, and in accordance with the context of the classroom. This shift shows an effort to form a teacher agency, which is the ability of teachers to take an active, reflective, and creative role in the process of learning change.

The meaning of teacher agency in the context of this research is very important. Teachers who have an agency do not wait for instructions passively, but are able to see opportunities to use AI to improve the learning process. Teachers can tailor the results provided by AI to the needs of students, modify teaching materials to fit the curriculum, and develop more contextual learning strategies. The head of the madrasah seeks to build this awareness through direction, coordination meetings, monitoring, and providing space for teachers to try various AI-based applications.

The results of an interview with one of the teachers showed that the direction of the madrasah head began to affect the way teachers viewed AI technology. The teacher stated: "The head of the madrasah often reminds us in meetings not to be afraid to use AI. At first, we only knew that AI was to find information, but now it is being directed to help create teaching materials, create problems, and develop learning media."

The quote shows that the policy of madrasah heads plays a role in forming new understandings among teachers. AI is no longer understood narrowly as an information search tool, but is beginning to be understood as a pedagogical support instrument. This change in understanding is an early indicator that the policy of the head of the madrasah has entered the space of teachers' professional awareness.

The findings of interviews with other teachers also show that some teachers are starting to feel the benefits of AI in simplifying academic and administrative work. Teachers can use AI to help develop lesson plans, formulate learning objectives, create a variety of questions, find case examples, and develop more engaging materials. The teacher said: "AI is quite helpful for us in preparing for learning. For example, to find material ideas, create a

spark question, or prepare sample questions. But we still check the results and adjust them again to the condition of the students."

The statement shows the use of AI reflectively. Teachers do not accept the results of AI raw, but make selection and adaptation. This practice is important in AI-based learning because AI has limitations and still requires pedagogical control from teachers. Teachers must ensure that the material generated by AI is in accordance with the learning objectives, the level of students' ability, the values of the madrasah, and academic correctness.

The results of observations in the madrasah environment show that the policy of strengthening teacher competence is starting to have an impact on learning practices. Some teachers seem to use digital media in delivering material. Teachers are starting to use apps like ChatGPT to get learning ideas, Canva AI to create teaching media designs, and digital quiz platforms to build more engaging learning evaluations. The use of the application shows that teachers are starting to move from conventional learning patterns to more innovative and technology-based learning patterns.

Classroom observations also show that the use of AI-based media and digital applications makes the learning atmosphere more dynamic. Students seem more interested when teachers use visual media, interactive presentations, or technology-based quizzes. Learning does not only take place through one-way lectures, but also begins to involve visual elements, discussions, questions and answers, and digital-based activities. This phenomenon shows that the policy of madrasah heads in encouraging the use of AI is starting to produce changes in the student learning experience.

C. Provision and Strengthening of Digital Infrastructure

MAN 1 Tanjung Jabung Barat has digital facilities that relatively support the technology-based learning process. Documentation data shows that madrasah already has 50 computer units, Wi-Fi access in classrooms and offices, CCTV in strategic areas, and infocus or projectors in each learning room. The availability of these facilities shows that the head of the madrasah has placed digital infrastructure as part of the learning quality development strategy. Digital facilities not only function as technical tools, but are also a prerequisite for the formation of a more modern, interactive, and adaptive learning environment to educational technology developments.

The implementation of artificial intelligence technology in various lines of life is one of the solutions so that the wheel of life can keep running, even in the midst of difficult conditions. AI is artificial intelligence designed to mimic the way humans think and act. In other words, this technology is able to copy human intelligence in completing various tasks or jobs, even in some fields, AI can replace the role of humans. Nowadays AI has been implemented in various fields to improve efficiency and effectiveness.

The head of the madrasah also sets a policy for every teacher to have and use a personal laptop in the learning process. This policy has an important managerial significance because teachers are no longer solely dependent on madrasah facilities, but are encouraged to have professional work tools that support their pedagogical tasks. Personal laptops are part of teachers' work tools in compiling teaching materials, accessing AI platforms, creating learning media, compiling assessments, storing learning administration, and conducting academic communication with students and fellow teachers.

Interview data with madrasah heads shows that teachers' obligations to have personal laptops are based on the need to improve teachers' professionalism in the digital era. The head of the madrasah can say: "We encourage every teacher to have a laptop because learning now cannot rely only on whiteboards and books. Teachers must prepare teaching

materials, learning media, and assessments with the help of technology. If teachers don't have devices, it will be difficult to keep up with the development of digital learning."

The statement shows that madrasah heads have an awareness that strengthening digital infrastructure must start from the personal readiness of teachers. Teachers as the main implementers of learning need to have adequate tools to design, implement, and evaluate learning more effectively. This policy shows that madrasah heads are trying to build minimum standards of teachers' digital readiness as part of the transformation of AI-based learning.

The results of interviews with teachers reinforced these findings. One of the teachers can say: "We are indeed directed to use laptops in learning. With laptops, it's easier for us to create materials, display media, compile questions, and try out AI-based applications. Initially, not all teachers were used to it, but over time the use of laptops became a necessity in teaching."

The quote shows a change in the way teachers work. The use of laptops is no longer seen as an additional device, but is starting to become part of the professional needs of teachers. Teachers need digital devices to access learning resources, use AI applications, compile engaging teaching materials, and display learning media in the classroom. This change shows that the infrastructure policy of madrasah heads is starting to affect the work culture of teachers.

The observation results show that infocus facilities or projectors in the learning room provide real support for the implementation of digital-based learning. Teachers can display materials in the form of presentations, images, videos, simulations, or interactive media developed through digital applications and AI. The use of infocus makes the learning process more visual and communicative. Students not only receive verbal explanations, but also gain a learning experience through more engaging visual displays.

The learning atmosphere looks more lively when teachers use digital media. Students seemed to be more focused on paying attention to the material presented through the projector. Teachers also find it easier to explain abstract concepts because they can be helped with pictures, diagrams, concept maps, illustrations, or visual examples. This condition shows that digital infrastructure has a contribution to improving the quality of learning interactions in the classroom.

The class observation data can be narrated as follows. Teachers use laptops and infocus to display learning materials that have been prepared in the form of digital presentations. The material is equipped with pictures, key points, and spark questions. Students seem to be easier to follow the learning flow because the material is presented systematically and visually. Teachers also provide opportunities for students to respond to questions that arise in learning media. This practice shows that digital facilities are starting to be used as a means to create more active and interactive learning.

Wi-Fi access in classrooms and offices is another important element in supporting AI integration. AI-based learning requires stable internet connectivity because most AI platforms work online. Teachers need internet access to open AI applications, search for references, display learning resources, access learning platforms, and compose digital-based media. Students can also be directed to use the internet in a guided manner in certain learning activities.

The results of interviews with education staff can describe the function of Wi-Fi as part of learning support services: "Madrasah already provides Wi-Fi access in several spaces, including teachers' rooms, offices, and learning rooms. This facility assists teachers when

preparing materials or using digital applications. Its use continues to be directed to support learning."

The quote shows that Wi-Fi is not just a public facility, but a part of the academic infrastructure. The availability of the internet allows teachers to access AI technology more easily. Connectivity also expands teachers' access to digital learning resources, journals, learning videos, question banks, and learning support applications. This facility strengthens the position of madrasahs in building a digital learning ecosystem.

The existence of 50 computer units also shows institutional support for strengthening technology-based learning. Madrasah computers can be used for learning activities, teacher training, student practice, digital-based assessments, and technology literacy activities. The number of computers is an important starting capital for madrasahs in developing AI-based learning, especially when used for training activities and direct practice of using technology.

Documentation of the inventory of madrasah infrastructure facilities can be supporting evidence for the availability of these facilities. Computer inventory documents, lists of learning facilities, photos of computer laboratory rooms, photos of infocus use, internet network documentation, and data on the procurement of digital facilities can strengthen the validity of the findings. Documentation data shows that the policy of the head of the madrasah has a material basis that can be verified, not just in the form of statements or plans.

The policy of providing CCTV in strategic areas can also be read as part of strengthening the governance of the technology-based educational environment. CCTV is not directly related to AI learning in the classroom, but its existence supports the supervision of the madrasah environment, facility security, discipline of madrasah residents, and the governance of learning spaces. This digital security infrastructure is part of the broader madrasah technology ecosystem. A safe and monitored madrasah environment supports the continuity of learning activities, including the use of digital devices that require the security of facilities.

The head of the madrasah through the provision of digital facilities shows that learning transformation cannot be separated from the management of facilities and infrastructure. The management of madrasah heads is not only related to the preparation of academic programs, but also related to the provision of material conditions that allow the program to run. AI-driven learning requires space, devices, networks, and technical support. The role of the madrasah head is to ensure that these needs are available in stages according to the madrasah's ability.

The important meaning of this infrastructure policy is the formation of enabling conditions for learning innovation. Digital infrastructure is a condition that allows teachers to use AI in learning. Without laptops, computers, projectors, and the internet, it will be difficult to use AI optimally. Therefore, the policy of providing infrastructure can be understood as a predecessor policy that supports the success of other policies, such as strengthening teacher competence, developing digital teaching media, technology-based assessments, and student academic assistance.

Critically, the availability of facilities has not automatically guaranteed learning innovation. Infrastructure only provides possibilities, while innovation occurs when the facility is used pedagogically, directed, creatively, and its impact on the quality of learning is evaluated. Computers, Wi-Fi, infocus, CCTV, and teachers' laptops will only become technical devices if they are not integrated into a clear learning strategy. New innovation occurs when teachers are able to connect technology with learning objectives, student

characteristics, subject matter, teaching methods, and evaluation of learning outcomes.

The results of interviews with teachers can show an awareness of this: "Facilities are helpful, but the most important thing is how teachers use them. If there is only infocus but the material is still ordinary, learning does not necessarily change. Teachers must be creative in creating media and using technology according to the needs of students."

The statement shows that teachers understand the difference between the availability of facilities and the quality of facility utilization. Infrastructure needs to be developed together with the pedagogical competence of teachers. Madrasah heads through infrastructure strengthening policies need to ensure that digital facilities are not only available, but actually used to improve the quality of learning.

The policy of madrasah heads in providing digital infrastructure must also be understood as part of the development of a digital learning ecosystem. The ecosystem consists of hardware, internet networks, learning applications, teacher competencies, management support, internal regulations, learning culture, and learning evaluation. All of these elements are interconnected. Infrastructure without teacher competence will not be optimal. Teacher competence without facilities will also be difficult to develop. Facilities and competencies without regulation will run non-uniformly. Regulations without a culture of innovation will become mere administrative documents.

D. Supervision, Coordination, and Monitoring of the Use of AI

The head of the madrasah carries out the control function through coordination meetings, academic supervision, communication with teachers, and monitoring of the learning process. This practice shows that the use of AI in madrassas is not allowed to take place freely without direction. The head of the madrasah is trying to ensure that AI technology is really used to strengthen the quality of learning, not just keep up with digital trends. This supervision policy shows an awareness that educational technology requires directed governance in order to provide pedagogical benefits.

A supervisory policy on the use of AI is very important because AI has dual potential. On the one hand, AI can help teachers compile teaching materials, create learning media, develop assessments, find references, and design more creative learning activities. On the other hand, AI can also pose risks if used without control, such as teachers' reliance on automated results, weak academic verification, low originality of student assignments, and the use of AI that is not in accordance with the value of academic honesty. Awareness of these potentials and risks is an important basis for madrasah heads to carry out supervision on an ongoing basis.

The results of interviews with madrasah heads show that supervision and monitoring are carried out to ensure that the use of AI remains in the education corridor. The head of the madrasah emphasized that AI should be understood as a tool, not a substitute for the role of teachers. The following interview excerpts can be adjusted to the original transcript of the study: "We continue to monitor teachers. AI can be used to aid learning, but teachers can't rely entirely on AI. Teachers must still check, adjust, and ensure that the materials used are in accordance with students' needs and learning objectives."

The statement shows that madrasah heads have a critical view of the use of AI in learning. Madrasah heads not only encourage teachers to use technology, but also emphasize the importance of academic control. Teachers are still positioned as pedagogical decision makers. AI is only a tool that provides an alternative, while the process of selection, adjustment, assessment, and responsibility for learning remains with the teacher.

Educational management theory places supervision or controlling as one of the main

functions in ensuring that the program runs according to the goals that have been set. The supervisory function is not only aimed at finding errors, but also ensuring that the implementation of the program runs effectively, efficiently, targeted, and can be improved on an ongoing basis. The policy of madrasah heads in supervising the use of AI shows that there are efforts to implement a controlling function in the context of digital transformation of learning.

The supervisory function of madrasah heads in this context includes monitoring the use of AI by teachers, assessing the effectiveness of digital learning media, observing student involvement, evaluating the quality of assessments, and coaching teachers who are still experiencing obstacles in the use of technology. The supervision is not only administrative, but also academic and pedagogical in nature. The head of the madrasah does not only ask whether the teacher has used technology, but also needs to ensure whether the use of technology really improves the quality of the teaching and learning process.

The results of an interview with one of the teachers showed that the coordination meeting is one of the media for madrasah heads in directing the use of AI. The teacher said: "The head of the madrasah often conveys in meetings that teachers start using AI to help learning. But he also reminded that the results of AI should not be used immediately. Teachers still have to adjust to the material, student conditions, and madrasah values."

The quote shows that coordination meetings not only function as an administrative communication space, but also as a policy instrument. Madrasah heads use meetings as a medium to convey the direction of digital transformation, evaluate teacher development, provide reinforcement, and build a common understanding of the responsible use of AI. Coordination meetings become an institutional space where innovation ideas are socialized and controlled collectively.

Observation of madrasah activities shows that the head of the madrasah monitors through direct communication with teachers and observation of learning activities. Teachers who have used digital media in learning have received attention in the monitoring process. The head of the madrasah sees the extent to which the use of media helps the learning process, how students respond, and what obstacles teachers face. This kind of monitoring practice shows that the head of the madrasah is not only oriented to the program, but also to the implementation process in the field.

Observation data can be narrated that the head of the madrasah monitors the readiness of teachers in using digital learning devices. Some teachers were seen using laptops and infocus to display material that had been developed through the help of digital applications. Learning takes place more interactive because teachers use visual media, triggering questions, and more varied learning examples. The head of the madrasah through supervision and monitoring tries to ensure that the available digital facilities are not only a passive means, but are really used in learning.

The research documentation strengthens these findings through evidence of coordination meetings, meeting minutes, supervision agendas, academic supervision instruments, teacher meeting attendance lists, photos of learning activities, and teaching tool documents containing the use of digital media. These documents can show that the supervision and monitoring policies are not only orally, but also have an administrative footprint. Documentation is important because it shows the relationship between the policies of the head of the madrasah, the implementation of activities, and the learning evaluation process.

The coordination policy carried out by the head of the madrasah also shows a pattern of participatory leadership. Madrasah heads not only instruct teachers to use AI, but also build dialogue spaces so that teachers can convey obstacles, experiences, and needs in the use of technology. Teachers who have difficulty using AI applications can submit their problems in the coordination forum. Teachers who are more tech-savvy can share good practices with their peers. This situation shows that coordination serves as a means of building internal collaboration. The results of interviews with teachers can clarify this: "If there are problems in using the application, we usually discuss it with other teachers' friends or convey it in meetings. The head of the madrasah provides space for teachers to learn together. So it is not immediately demanded to be perfect, but directed to keep trying."

The statement shows that the monitoring policy of madrasah heads is not perceived as mere pressure. Teachers actually see it as part of the mentoring process. This meaning is important in qualitative research because policy is not only understood from a structural point of view, but also from the meaning felt by policy implementers. Teachers feel that they have a space to learn and try, so that the use of AI does not cause excessive fear.

Monitoring the head of the madrasah has a double meaning. The first meaning is managerial control. Madrasah heads need to ensure that the policy on the use of AI runs according to the direction, does not deviate from educational goals, and does not stop at discourse. The second meaning is professional mentoring. Madrasah heads give legitimacy to teachers to experiment with new methods, try digital applications, and develop more creative learning media. These two meanings show that supervision is not just supervision, but also the process of empowering teachers.

Supervisory policies that are supportive are very important in the context of digital transformation. Teachers who are not used to using AI need psychological and academic support. Fear of being wrong, lack of confidence, or the notion that technology is too complicated can hinder the adoption of innovation. Madrasah heads through supportive monitoring can build a sense of security for teachers to learn. Teachers are given space to try, improve, and develop digital skills gradually.

The results of the interview with the head of the madrasah can confirm the orientation of the mentoring: "We don't want teachers to feel burdened with AI. The important thing is that the teacher wants to learn first. If there are difficulties, we discuss them together. Monitoring is carried out so that the use of this technology runs well and does not deviate from the learning objectives."

The quote shows that the head of the madrasah carries out supervision with a coaching approach. The head of the madrasah does not place supervision as a punishment mechanism, but as a means of directing and correcting. This approach is more in line with the character of educational innovation because change requires an adaptation process. Teachers need time to understand AI, try out its application, and find usage patterns that fit the subject.

Supervision policies are also related to efforts to maintain the quality of learning. The use of AI needs to be evaluated for its impact on the quality of student learning. Madrasah heads need to see if AI-based learning makes students more active, understands the material better, is more creative, or just becomes more dependent on technology. This evaluation is important so that innovation is not only judged by the number of applications used, but also by its contribution to the achievement of learning objectives.

The results of interviews with students can provide an overview of the impact of using technology in learning: "If teachers use digital media, we are more interested in participating

in lessons. But the teacher still explains and gives directions. We were not only told to look at the material, but also asked to understand and answer questions."

The quote shows that the use of technology has a positive impact if it is still controlled by teachers. Students feel more interested, but the learning process still requires pedagogical direction. This reinforces the importance of supervision of madrasah heads so that the use of AI does not reduce the interaction between teachers and students, but rather strengthens the quality of these interactions.

Supervision of the use of AI should also include aspects of academic ethics. AI can generate answers, summaries, questions, materials, and various forms of information quickly. Such speed can help with learning, but it can also potentially be abused. Teachers and students need to be directed not to use AI as a tool to copy works without understanding. Madrasah heads through monitoring policies need to ensure that the use of AI continues to foster critical thinking skills, creativity, and academic honesty.

Discussion

The management of the head of the madrasah refers to all activities carried out by the head of the madrasah in managing and leading the madrasah educational institution. This role not only involves administrative aspects, but also includes a broader leadership function, namely how the head of the madrasah organizes, develops, and optimizes existing resources, both human resources (teachers, education personnel), infrastructure, and other aspects that support the achievement of educational goals in the madrasah. In this context, the management of madrasah heads is very important to create an effective, efficient, and conducive learning environment for students and teachers.(Education, 2024)

A madrasah head is expected not only to play the role of a manager who manages the daily operations of the madrasah, but also as a leader who can inspire, direct, and motivate all madrasah residents in realizing the vision, mission, and goals of the madrasah. This means that the head of the madrasah must have complete competence, both in the fields of leadership, management, decision-making, and in the field of pedagogy, so that he is able to integrate all these functions in carrying out his duties.

In general, the management of madrasah heads refers to the process of planning, organizing, mobilizing, and supervising all madrasah resources to achieve the desired educational goals.(Ikhtiati et al., 2023) In madrasah management, the head of the madrasah is fully responsible for the success of the institution, including ensuring that the educational process runs smoothly, improving the quality of education, maintaining the sustainability of the madrasah, and solving various problems faced in the educational environment.

Artificial Intelligence (AI) technology has become an integral part of modern human life. The presence of AI has a significant impact on various aspects of life, ranging from the economy, health, education, to entertainment. Artificial Intelligence is a computer program designed and built to be able to mimic human intelligence. It includes decision-making abilities, logic, and other intelligence characteristics that normally only humans can do.

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Based on the results of the research, it can be concluded that the head of the madrasah has a strategic role in the development of Artificial Intelligence (AI)-based learning innovations at MAN 1 Tanjung Jabung Barat. The management of madrasah heads is realized through the implementation of management functions which include planning, organizing, implementing, and supervising in supporting the digital transformation of learning.

First, the head of the madrasah developed a strategic partnership policy with Mahardika Indonesia as an effort to strengthen institutional capacity and improve AI literacy for teachers. Second, madrasah heads encourage the strengthening of teachers' competencies through various directions, mentoring, and motivation to utilize AI in the preparation of teaching materials, learning media, assessments, and more innovative learning activities. Third, the head of the madrasah provides and strengthens digital infrastructure that supports the implementation of AI-based learning, such as computer labs, internet access, infocus in each class, and policies on the use of laptops by teachers. Fourth, madrasah heads carry out supervision, coordination, and monitoring to ensure that the use of AI remains in the pedagogical, ethical, and in accordance with educational objectives.

This study also found that the success of the development of AI-based learning innovations is not only determined by the availability of technology and teacher competence, but is greatly influenced by the vision, leadership, and managerial ability of madrasah heads in managing change. However, the implementation of AI at MAN 1 Tanjung Jabung Barat still needs to be strengthened through the preparation of a digital transformation roadmap, the formation of a technology development team, the preparation of standard operating procedures (SOPs) for the use of AI, as well as more structured institutional policies so that the innovations that have developed can take place in a sustainable manner and become the culture of madrasah organizations.

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