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Transformational Leadership in Building a Culture of Artificial Intelligence Utilization in Schools

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ABSTRACT

The rise of generative artificial intelligence has changed teachers' professional work, yet its use in schools depends less on technology than on leadership that builds vision, competence, support, and a culture of responsible use. Using transformational leadership theory as a lens, this study analyzes how a foundation head builds a culture of artificial intelligence utilization in a school and how the dimensions of transformational leadership appear in that process. A qualitative single case study was conducted at an Islamic elementary school in Pekanbaru, Indonesia. Data were collected on 26 August 2026 through interviews with five purposively selected teachers and the foundation head as the key informant, and were supported by observation and documentation. The data were analyzed through condensation, coding, categorization, theme development, and theoretical interpretation. The findings show that leadership operates through five interrelated mechanisms: vision and role modeling, capacity building, social learning, responsible use, and institutionalization. The foundation head demonstrated artificial intelligence use personally, organized structured training, provided facilities, encouraged peer exchange, and insisted on verifying outputs. Teachers used these tools for lesson plans, materials, assessments, and media, and practice appears to be moving from individual adoption toward institutionalized routines, although this conclusion remains tentative given the limited scope of the study. The novelty of this study is the Artificial Intelligence Transformational Leadership Pathway, a conceptual model that sequentially links the four dimensions of transformational leadership to collective norms of technology use.

Keywords: transformational leadership, artificial intelligence, work culture, teacher competence, responsible use, case study

INTRODUCTION

Generative artificial intelligence (AI) has changed many areas of life, including education. Its ability to produce text, images, ideas, designs, and other content within seconds gives teachers new opportunities to develop their teaching practice while completing professional tasks more efficiently. The presence of AI does not only change how teachers produce learning materials; it also changes the professional roles and competencies expected of them. UNESCO treats teachers' ability to use AI as a new competency that covers a human-centred mindset, the ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning (Cukurova & Miao, 2024) . This framework stresses that teachers must be able to use AI while preserving human agency, responsibility, and ethical judgment.

These changes make educational leadership increasingly important, because technology use does not happen automatically once a school provides digital devices. Teachers need a

clear vision, organizational support, competency development, facilities, and a working environment that allows them to learn and adapt. This study uses transformational leadership theory as its main lens. The theory is conventionally described through four related dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, which together explain how leaders influence followers through role modeling, a compelling vision, encouragement of critical thinking and new approaches, and attention to each person's developmental needs (Yu & Jang, 2024).

Bass and Riggio (2006) describe transformational leaders as those who raise followers' motivation and commitment beyond routine compliance. In schools this matters because change in teaching practice rarely follows from a mandate alone: teachers also learn by observing and imitating credible colleagues, a process Bandura (1977) described as social learning.

Recent studies confirm the relevance of this framework for technology integration in schools. (Schmitz et al., 2023) showed that principals' transformational leadership is positively related to teachers' technology beliefs, technical skills, and pedagogical abilities, and (Schmitz et al., 2025) found that it is also associated with more formal and informal teacher collaboration. (Chassida, 2026) reported that transformational leadership predicts teachers' perceptions of AI and strengthens the link between those perceptions and actual use, acting as a contextual enabler. This is consistent with (H.-Y. Wang et al., 2025), who showed that transformational leadership influences employees' AI use through perceived organizational support. (Zeng et al., 2025), in a systematic thematic review, concluded that principals' digital leadership raises teachers' competence in integrating AI through resources, professional development, learning communities, and a supportive organizational culture, while resistance, limited training, infrastructure, and the risk of dependency remain challenges to be managed.

Research on generative AI in school leadership points in the same direction. Interviews with principals from six Arab countries identified visionary, collaborative, and adaptive leadership roles as central to integrating generative AI, over and above technological literacy (Ghamrawi et al., 2025). A survey of 302 school leaders in Israel found that generative AI was most widely used in instructional leadership, and that adoption varied with leaders' seniority and role (Berkovich, 2025). Studies of teachers point to similar conditions and risks: generative AI supports personalized materials and faster feedback but also raises concerns about overreliance and data privacy (Shrestha et al., 2025), and teachers' intention to use it depends on familiarity, perceived challenges, and resilience to change (Gârdan et al., 2025). A systematic review of K-12 studies found that most research involved high school students and preservice teachers (Alfarwan, 2025), so the school-level practice of in-service teachers is less documented.

Most of these studies are quantitative and survey-based. They explain the relationship between transformational leadership and AI perceptions or use, but few describe in detail the process by which leadership dimensions are enacted in daily practice until they become collective habits. This study addresses that gap through a qualitative case study at SD Islam Riau Global Terpadu Pekanbaru, an Islamic elementary school whose vision, Leading School Based on EURICA 165 and 21st Century Skills, places adaptation to technology, collaboration, and creativity at the center of school development. Ayah Jasman Jaiman, the head of the foundation, is a central actor in promoting AI in this school, and he uses AI himself rather than merely recommending it. He emphasized that AI is "a tool, not the goal of education and not a replacement for humans" (Jasman Jaiman, interview, 26 August 2026). Before AI became part of teachers' work, lesson materials were mostly prepared manually according to a school format, a time-consuming process, even though teachers already used platforms such as

Quizizz and Wordwall for assessment (Mr. Firman and Ms. Semita, interviews, 26 August 2026).

The purpose of this study is to analyze how the foundation head builds a culture of AI utilization in the school, and how each finding relates to the relevant dimension of transformational leadership. Specifically, it examines the leader's vision and role modeling, the development of teachers' AI competence, peer learning among teachers, responsible AI practice, and the early formation of institutionalized AI-based work patterns. The conceptual contribution is the AI Transformational Leadership Pathway, an inductively derived process model that links each stage to an underlying leadership dimension, extends the unit of analysis from the leader–individual dyad to collective mechanisms, and treats institutionalization as the point at which individual behavior becomes a more stable organizational practice.

As a qualitative study, it does not test hypotheses. It is guided by two questions: (1) How does the foundation head build a culture of AI utilization in the school? (2) How do the dimensions of transformational leadership appear in that process?

METHODS

This study employed a qualitative approach with a single case study design. The approach was chosen because the study focuses on experiences, perceptions, practices, and processes of change in a natural school setting, and because a case study permits the detailed tracing of processes that large-scale surveys rarely capture. The case is SD Islam Riau Global Terpadu Pekanbaru. Interview data were collected face to face on 26 August 2026; each interview lasted about 10–15 minutes and was audio-recorded.

Five teachers were selected through purposive sampling because they had direct experience using AI in their professional work: Mr. Firman (English teacher), Ms. Semita (Indonesian language teacher and Grade 6 homeroom teacher), Ms. Resti (science teacher and Grade 4 homeroom teacher), Ms. Agi (Indonesian language teacher and Grade 4 homeroom teacher), and Ms. Athaya (science teacher and Grade 3 homeroom teacher). Ayah Jasman Jaiman, the head of the foundation, served as the key informant on vision, policy, strategy, training, and leadership practice.

Data were collected through three complementary techniques. Interviews explored experiences before and after AI use, responses to the foundation head's policy, training, AI applications, changes in work, collaboration, and perceived risks. Observation covered training activities, discussions in the regular Saturday meeting, and the preparation of AI-assisted learning products. Documentation included teaching tools, assessments, learning media, posters, infographics, presentations, and records of training activities.

Analysis followed the sequence of transcription, data condensation, coding, categorization, theme development, theoretical interpretation, and conclusion, adapting the principles of reflexive thematic analysis (Braun & Clarke, 2022). Transcripts were read repeatedly to identify meaning units, which were given descriptive codes, grouped into categories, and developed into themes. Table 1 illustrates the path from raw data to themes. Trustworthiness was strengthened through source triangulation (comparing the foundation head's account with those of the five teachers) and technique triangulation (comparing interviews with observations and documents), and by systematically recording the coding steps.

Table 1. Example of the Coding Process from Raw Data to Themes

Raw Data Excerpt	Code	Category	Theme
"Because a leader must be a role model." (Jasman Jaiman)	Leading by direct example	Leader role modeling	Vision and role modeling
"It used to take a week, now it takes five minutes." (Mr. Firman)	Work time efficiency	Change in productivity	Change in teachers' work practice
"We share prompts and share which AI is good." (Mr. Firman)	Knowledge exchange among teachers	Informal learning	Social learning
"Don't swallow whole whatever AI tells you." (Ms. Semita)	Critical attitude toward AI output	Verification and validation	Responsible AI

Source: Interview data, 26 August 2026

RESULT AND DISCUSSION

Data analysis produced five main themes, summarized in Table 2. They are presented below in the order in which informants described them.

Table 2. Main Themes and Key Findings

No.	Theme	Key Finding
1	Vision and role modeling	The foundation head builds an adaptive vision toward AI and personally models its use
2	Capacity building	Structured training and supporting facilities build teachers' AI competence
3	Social learning	Teachers learn from each other through sharing experiences, observation, and exchanging prompts
4	Responsible AI	Teachers cross-check, adapt, and evaluate AI output
5	Institutionalization	AI enters teaching tools, assessments, media, regular meetings, and daily work routines

Source: Research data, 2026

Vision and role modeling

The drive to use AI began with direction from the foundation head, who holds that a leader must understand the technology he directs others to use and show its application directly: "Because a leader must be a role model" (Jasman Jaiman, interview, 26 August 2026). Teachers observed this practice. Mr. Firman described him as visionary and highly attentive to AI developments, and said that a leader who actively uses AI encourages teachers to learn it too. The leader's presentation material on the school's visual framework road map is shown in Figure 1.



Figure 1. Leader's Presentation Material on the Road Map Visual Framework of IRGT School

Source: Research documentation, 2026

The findings show that the foundation head's practice is consistent with all four dimensions of transformational leadership. Vision and role modeling reflect idealized influence and inspirational motivation; training and facilities adapted to teachers' needs reflect individualized consideration; and the emphasis on verification and critical thinking reflects intellectual stimulation. This supports (Schmitz et al., 2025), who showed that transformational leadership supports technology integration through teachers' beliefs, skills, and pedagogical abilities. The study extends that work by showing *how* the influence unfolds in sequence: not as an immediate direct effect, but as a series of processes (vision, role modeling, capacity building, and social learning) that cumulatively create conditions for critical and reflective AI use. This also echoes (Chassida, 2026): here, the leader's example did not automatically produce teacher use, but required capacity building and peer learning as mediator.

Capacity building

The school held training at the beginning of the academic year on using AI for teaching tools, materials, assessments, and media. The foundation head explained that training was meant to help teachers understand why and how to use AI appropriately, not merely to follow instructions. Not all teachers could use AI at first; Ms. Agi said, "At first I was rather confused, especially about writing the right prompts." Through practice teachers found suitable patterns of use, supported by computers, projectors, and Wi-Fi at school. Documentation of the training sessions is shown in Figure 2, and the training material together with an example of the prompts given during the training is shown in Figure 3.



Figure 2. Training on the Use of AI for Developing Modules and Teaching Tools
Source: Research documentation, 2026

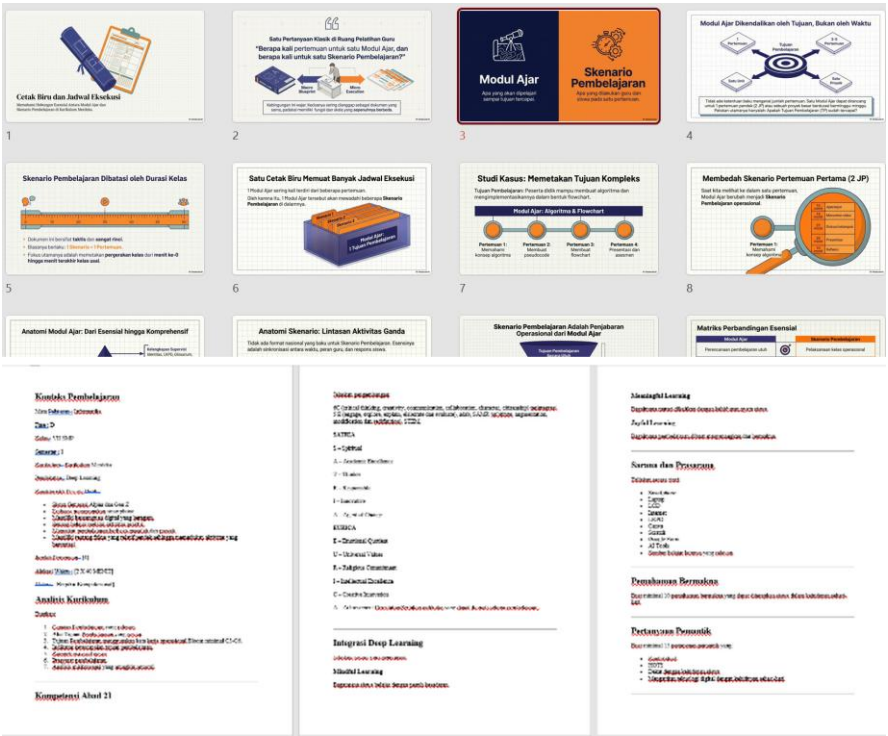

Figure 3. Training Material and an Example of Prompts Given During the Training
Source: Research documentation, 2026

The foundation head's own AI use served two analytically distinct functions: it demonstrated AI's relevance to professional work credibly, and it gave teachers legitimacy to treat AI use as part of the organization's direction rather than a normative suggestion. Role modeling therefore acted as a catalyst of technology adoption, and its influence worked through observation and identification instead of formal orders. Training then converted early confusion into practical skill. Using AI requires more than opening an application; it requires writing prompts, evaluating results, and integrating them with learning goals, which is consistent with UNESCO's emphasis on AI for professional learning (Cukurova & Miao, 2024). Training that came with gradual assistance, facilities, and hands-on practice reflects individualized consideration rather than uniform policy. This resembles (Lademann et al., 2025), whose training combining webinars, self-paced modules, and a practical project

improved teachers' AI literacy, and (Landa-Blanco, 2025), who identifies sustained training and adequate infrastructure as conditions for equitable adoption.

Social learning

Beyond formal training, teachers learned through interaction with colleagues. Mr. Firman. said, "We share prompts, share which AI is good, we often share and learn too." Sharing took the form of exchanging prompts, recommending applications, and demonstrating use, so that teachers who mastered an application first became learning resources for others. The pattern of learning thus expanded from vertical (leader to teacher) to horizontal (teacher to teacher).

The school's AI culture was not built through formal training alone. Exchanging prompts and application recommendations created an informal learning path that works independently of the leader's direct intervention. This agrees with (Schmitz et al., 2025), who found a positive link between transformational leadership and teacher collaboration, and with (Bandura & Walters, 1977) account of learning through others, and clarifies the mechanism: leadership creates initial conditions through vision and example, which then allow teachers to become agents who spread AI practice among peers. Leadership influence thus shifts from a vertical leader–teacher relationship to a horizontal teacher–teacher network, an extension rarely explored in conventional frameworks focused on the leader–follower dyad.

Change in teachers' work practice

Preparing teaching tools once took a long time. Mr. Firman said, "It used to take a week, now it takes five minutes." Efficiency was not the only change: Ms. Agi explained that teachers' attention could shift toward developing engaging learning that fits students' needs. Teachers used ChatGPT, Claude, Gemini, and Canva AI for lesson plans and modules, materials, assessments, questions, media, posters, infographics, activity ideas, and presentations. Examples of these products, namely classroom teaching material, an assessment, and a teaching module, are shown in Figure 4.

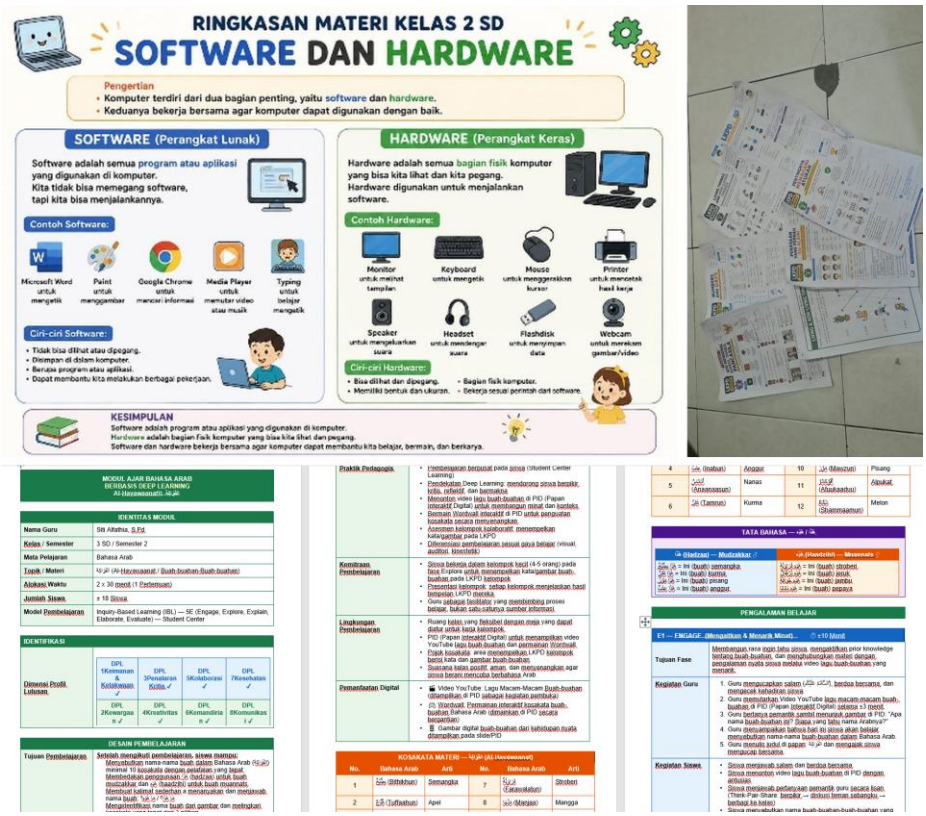

Figure 4. Examples of AI-Assisted Learning Products: Teaching Material, Assessment, and Teaching Module
Source: Research documentation, 2026

AI delivered efficiency, but the more important change was a shift in teachers' attention from the technical completion of teaching tools toward creativity, varied activities, and more personalized responses to students.

The five themes are not parallel categories but depend on one another. Vision and role modeling gave capacity building its legitimacy: training was framed as helping teachers understand why and how to use AI, not only how to operate it. Capacity building supplied the minimum competence, including prompt writing, that made peer exchange possible, since teachers cannot share what they cannot yet do; those who mastered an application first became resources for others. Social learning then widened practice, as teachers drew on several tools (ChatGPT, Claude, Gemini, and Canva AI) and compared "which AI is good." This variety created the need for shared standards, which is where responsible AI enters, because the verification flow gives teachers a common basis for judging outputs that come from different tools. Institutionalization appears when these elements recur together: AI-assisted products appear in teaching tools and school displays, and the Saturday meeting regularly reviews prompts, results, and cross-checking. The relation is also circular. Because the Saturday meeting is where peer exchange and verification are repeated and refined, institutionalized routines feed back into social learning and responsible AI. The pathway is therefore sequential in its chronology but self-reinforcing in its operation, as shown by the dashed feedback line in Figure 7.

Responsible AI

Teachers were aware of AI's limits. Ms. Semita stressed, "Don't swallow whole whatever AI tells you." Teachers cross-checked, reread, compared outputs with books and other sources, and adjusted them to the learning context. The foundation head insisted that teachers remain the final decision makers and introduced the flow **Think → Ask → Check → Adapt → Apply → Reflect**, which positions AI as a co-pilot rather than a replacement for the teacher.

Cross-checking is central because broad AI use risks dependency if outputs are accepted uncritically, a risk that teachers in other contexts also report (Shrestha et al., 2025). The foundation head not only encouraged AI use but also set professional boundaries through the Think → Ask → Check → Adapt → Apply → Reflect flow. This is a concrete expression of intellectual stimulation and is in line with the human-centred mindset and AI ethics emphasized in the UNESCO framework (Cukurova & Miao, 2024). The culture that appears to be developing is not one in which "AI does everything," but one in which AI helps teachers work better while they continue to think and remain accountable for the final result.

Mechanisms linking leadership practice to teacher behavior, collective learning, and norms. The findings point to three linked mechanisms, which are offered as an interpretation of this case and not as tested causal paths. The first concerns change in teacher behavior. The foundation head's own use of AI made his direction credible, and Mr. Firman's remark that a leader who actively uses AI encourages teachers to learn it shows that observation supplied a model to imitate (Bandura & Walters, 1977). Training and facilities then supplied the means to act: Ms. Agi's early confusion about writing prompts gave way to practice supported by computers, projectors, and Wi-Fi. This sequence is consistent with (Wang & Liu, 2025), who found that transformational leadership influences AI use through perceived organizational support. In this school, support was visible as training and equipment, so adopting AI was a resourced, expected activity rather than an individual gamble.

The second mechanism concerns collective learning. Individual learning became shared learning because the school provided recurring occasions and a common vocabulary for exchange. Teachers informally traded prompts and recommended tools, and the regular Saturday meeting gave this exchange a fixed place in the school calendar, where prompt quality, AI results, and cross-checking practices were reviewed together. Repeated joint review converts private know-how into shared knowledge. It is plausible that a setting in which teachers can admit confusion and compare imperfect outputs also lowers the interpersonal risk of learning openly (Edmondson, 1999), although psychological safety was not measured in this study.

The third mechanism concerns the formation of norms. The leader's expectations became norms when they were turned into an explicit, teachable rule and then rehearsed. The Think → Ask → Check → Adapt → Apply → Reflect flow, the foundation head's statement that AI is "a tool, not the goal of education and not a replacement for humans," and Ms. Semita's "Don't swallow whole whatever AI tells you "Show that expectations about verification were voiced by both leader and teachers. When expectations are stated by a leader, practiced repeatedly, and reinforced by peers, they begin to function as taken-for-granted ways of working, which is how organizational culture is understood in (Schein, 2010) account. The data support this only as an early indication, because the norm was reported by informants and seen in meetings and documents at one point in time, not traced over time.

Institutionalization

There are signs that AI use is moving beyond individual adoption toward a more organizationally structured pattern. Ms. Resti stated, "It has become very much a culture. It is deeply embedded here at Global." Supporting evidence includes more frequent use of AI in teaching tools, assessments, materials, posters, infographics, and presentations, and its regular discussion in the Saturday meeting, where teachers review prompt quality, AI results, cross-checking practices, and appropriate use. Because this judgment reflects informants' perceptions at a single point in time, it is interpreted as an *early indication of institutionalization* rather than proof that a new work culture is fully established. Documentation of posters made with AI around the school environment is shown in Figure 5, and of class administration and wall magazine displays in Figure 6.



Figure 5. Posters Made with AI Around the School Environment
Source: Research documentation, 2026



Figure 6. Class Administration and Wall Magazine (Mading) Displays
Source: Research documentation, 2026

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Supporting factors, barriers, and dynamics. Several factors supported the development of AI use. At the leadership level were the foundation head's visible personal practice and a school vision (Leading School Based on EURICA 165 and 21st Century Skills) that already placed technology adaptation, collaboration, and creativity at the center, so AI could be presented as continuous with the school's direction instead of as an external demand. At the organizational level were structured training at the start of the academic year, computers, projectors, and Wi-Fi, and a fixed forum in the Saturday meeting. At the teacher level, earlier familiarity with platforms such as Quizizz and Wordwall and the time cost of manual lesson preparation (Mr. Firman and Ms. Semita) probably made the benefits of AI easy to recognize.

Barriers and tensions were also visible, although less prominent in the data. The first was uneven starting competence: not all teachers could use AI at first, and Ms. Agi's difficulty with prompts shows that competence, not willingness, was the initial bottleneck. The second was the risk of dependency and uncritical acceptance of output, which the verification flow manages but does not remove. The third is a dynamic worth noting: large efficiency gains (from "a week" to "five minutes") could encourage speed over professional judgment. The emphasis on shifting attention toward engaging learning counters this, but the data cannot show whether that shift is shared evenly across teachers. The fourth is durability: the culture so far relies on a visible, personally engaged leader and on school facilities, so its stability when leadership attention or resources change remains an open question. Finally, issues that earlier studies identify, such as data privacy (Shrestha et al., 2025), resistance, and limited infrastructure (Zeng et al., 2025) , were not raised by informants in these short interviews. Their absence should not be read as evidence that they do not exist. Future research should examine them through longer interviews, teachers who use AI less or not at all, and longitudinal observation.

The AI Transformational Leadership Pathway. The findings were derived inductively into the model shown in Figure 7. The order of stages mirrors the chronology informants described: the foundation head first set the vision and became a role model, then formal training followed, then informal peer learning grew over time, and finally collective awareness of verification and routinization emerged. Stage 1 corresponds to idealized influence and inspirational motivation, stage 2 to idealized influence, stage 3 to individualized consideration, stage 4 to the horizontal extension of influence, stage 5 to intellectual stimulation, and stage 6 to the point at which individual behavior begins to consolidate into organizational practice. The linear order should not be read as one-directional: once routines such as the Saturday

meeting are in place, they return to stages 4 and 5 by renewing peer exchange and verification practice, as shown by the dashed feedback line in Figure 7.

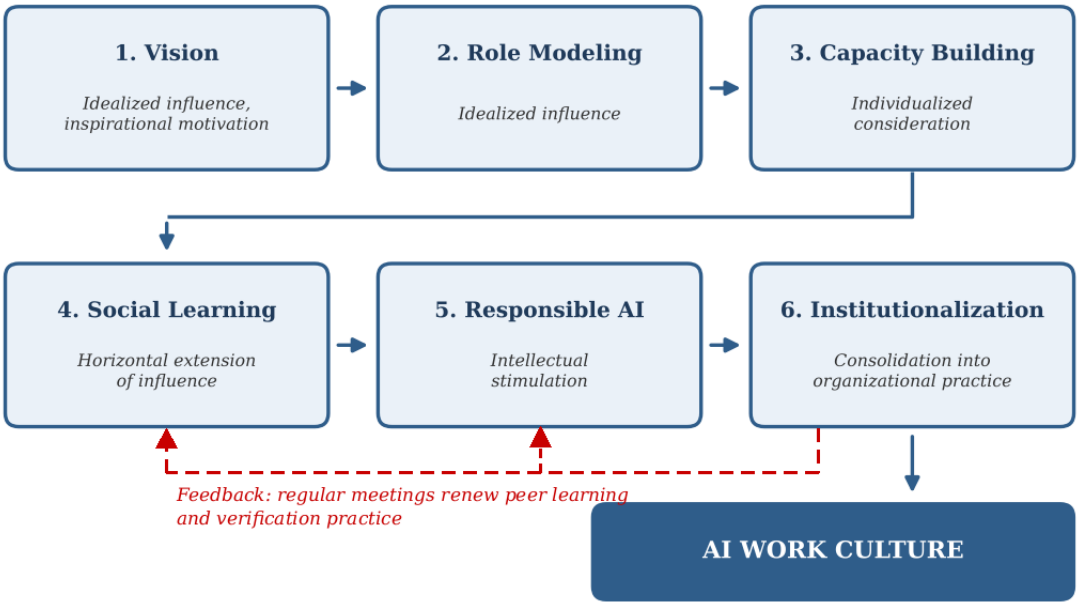

Figure 7. AI Transformational Leadership Pathway
Source: Authors' analysis, 2026

Empirical grounding of each stage. Table 3 sets out the evidence behind each stage of the pathway and how far it is triangulated. A stage is rated as triangulated when it rests on accounts from both the foundation head and at least one teacher, together with observation or documentation that directly records it. This holds for stages 1, 3, and 5. Stages 2, 4, and 6 are less firmly grounded: the teacher accounts for them come mainly from a single informant (Mr. Firman for stages 2 and 4, Ms. Resti for stage 6), and no observation or document directly records the leader's modeling in stage 2. The order of the stages reflects the chronology that informants recalled, not change observed over time. Because interviews were short and informants were selected for their experience with AI, the pathway is best read as a case-grounded model that needs testing, not as an established sequence.

Table 3. Empirical Evidence Supporting Each Stage of the Pathway

Stage	Leadership dimension	Empirical evidence	Data sources and strength of evidence
1	Idealized influence; inspirational motivation	Vision of AI as "a tool, not the goal of education and not a replacement for humans" (foundation head); Mr. Firman describes him as visionary and attentive to AI developments; school vision places technology adaptation at the center.	Interviews (foundation head, teacher); documentation (Figure 1). Triangulated across sources and techniques.
2	Idealized influence	"Because a leader must be a role model" (foundation head); he uses AI personally; Mr. Firman states that a leader who actively uses AI encourages teachers to learn it.	Interviews (foundation head, Mr. Firman). Moderate: the teacher account comes from one informant, and no observation or document directly records the modeling.
3	Individualized consideration	Training at the start of the academic year on teaching tools, materials, assessments, and media; aim of explaining why and how to use AI; Ms. Agi's early confusion about prompts; computers, projectors, and Wi-Fi.	Interviews (foundation head, Ms. Agi); observation of training; documentation (Figures 2–3). Triangulated across sources and techniques.
4	Horizontal extension of influence	"We share prompts, share which AI is good, we often share and learn too" (Mr. Firman); exchange of prompts, recommended applications, and demonstrations; peer discussion in the Saturday meeting.	Interview (Mr. Firman); observation of the Saturday meeting. Moderate: the quoted account comes from one informant.
5	Intellectual stimulation	"Don't swallow whole whatever AI tells you" (Ms. Semita); teachers cross-check outputs against books and other sources; Think → Ask → Check → Adapt → Apply → Reflect flow; teachers remain final decision makers.	Interviews (Ms. Semita, foundation head, teachers); observation of the Saturday meeting. Triangulated across sources and techniques.
6	Consolidation into organizational practice	"It has become very much a culture" (Ms. Resti); AI in teaching tools, assessments, posters, and infographics; regular discussion in the Saturday meeting.	Interview (Ms. Resti); documentation (Figures 4–6); observation. Tentative: perceptions at a single time point.

Source: Interview, observation, and documentation data, 2026

CONCLUSION

This study concludes that Ayah Jasman Jaiman, as head of the foundation, played an important role in building AI utilization patterns at SD Islam Riau Global Terpadu Pekanbaru through five mechanisms that map onto transformational leadership: vision and role modeling (idealized influence and inspirational motivation), capacity building (individualized consideration), social learning (horizontal extension of influence), responsible AI (intellectual stimulation), and institutionalization. AI changed teachers' work, particularly in preparing teaching tools, assessments, materials, and media, and the most visible changes were greater efficiency and more varied, creative learning, accompanied by awareness of dependency risks. The resulting AI Transformational Leadership Pathway shows that AI can become part of school work patterns when leaders provide direction, set an example, build individual competence, create horizontal collaboration, and keep humans as the main decision makers. The analysis further suggests that these mechanisms work through credible modeling and organizational support that change teacher behavior, recurring forums such as the Saturday meeting that turn individual learning into collective learning, and explicit, rehearsed rules such as the verification flow that can harden into norms.

The study has limitations. It covers a single school at one point in time (26 August 2026); interviews were short (10–15 minutes); and the perspectives of students, parents, and other staff were not included, so effects on student learning cannot be inferred. Evidence for some stages of the pathway comes mainly from one or two informants (Table 3). Informants were selected for their experience with AI, so teachers who use it less or not at all, and the barriers they may face, are under-represented. The order of stages reflects informants' recollections rather than observed change over time. The term "AI work culture" should therefore be read as a conceptual end point, and the model needs testing in other schools over longer periods. Theoretically, the study suggests that the transformational leadership framework should include collective mechanisms such as social learning in addition to leader–individual relations. Practically, school leaders should model AI use, provide continuous training tailored to individual teachers, deliberately build collaborative learning communities, adopt explicit and teachable principles of responsible AI, and judge the success of AI integration by its contribution to the quality of teachers' professional engagement, not by efficiency alone.

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