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Teacher Creativity and Learning Technology Integration in Islamic Religious Education at Tinokkah Public Elementary School Number 104332

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Abstract

This study aims to determine teacher creativity and the effectiveness of technology utilization in Islamic Religious Education (IRE) learning at SDN Tinokkah No. 104332, while identifying supporting and inhibiting factors in its implementation. This study uses a descriptive method with a qualitative approach. Data collection techniques were carried out through observation, interviews, and documentation, while data analysis techniques used data reduction, data presentation, and drawing conclusions. The results show that IRE teachers have demonstrated creativity in utilizing learning technology, such as the use of PowerPoint, learning videos, and digital images to help explain abstract material so that it is easier for students to understand. The use of technology has a positive impact on the learning process, as seen from the increase in student enthusiasm, attention, and understanding of the material presented. Supporting factors include teachers' willingness to learn and innovate and school support, while inhibiting factors include limited facilities and access to technology. Thus, teacher creativity and the use of technology play an important role in improving the quality of IRE learning.

Keywords: *Creativity, Teachers, Technology, Learning, Islamic Education.*

Abstrak

Penelitian ini bertujuan untuk mengetahui kreativitas guru serta efektivitas pemanfaatan teknologi dalam pembelajaran Pendidikan Agama Islam (IRE) di SDN Tinokkah No.104332, sekaligus mengidentifikasi faktor pendukung dan penghambat dalam pelaksanaannya. Penelitian ini menggunakan metode penelitian deskriptif dengan pendekatan kualitatif. Teknik pengumpulan data dilakukan melalui observasi, wawancara, dan dokumentasi, sedangkan teknik analisis data menggunakan reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa guru IRE telah menunjukkan kreativitas dalam memanfaatkan teknologi pembelajaran, seperti penggunaan PowerPoint, video pembelajaran, dan gambar digital untuk membantu menjelaskan materi yang bersifat abstrak agar lebih mudah dipahami siswa. Pemanfaatan teknologi memberikan dampak positif terhadap proses pembelajaran, terlihat dari meningkatnya antusiasme, perhatian, dan pemahaman siswa terhadap materi yang disamIREkan. Faktor pendukung meliputi kemauan guru untuk belajar dan berinovasi serta dukungan sekolah, sedangkan faktor penghambat berupa keterbatasan fasilitas dan akses teknologi. Dengan demikian, kreativitas guru dan pemanfaatan teknologi berperan penting dalam meningkatkan kualitas pembelajaran IRE.

Kata Kunci: Kreativitas, Guru, Teknologi, Pembelajaran, IRE.

Latar Belakang Penelitian

Islamic Religious Education (IRE) at the elementary school level plays a crucial role as the primary foundation for shaping children's character and noble morals from an early age. Ideally, IRE should go beyond a mere transfer of theory or the memorization of religious texts; instead, it must instill spiritual and moral values that students can directly apply in their daily lives. Unfortunately, the reality on the ground shows that delivering IRE materials is becoming increasingly complex due to the rapid advancement of information technology. (Febriyoli et al., 2025).

To dissect the research problem objectively, this study utilizes a descriptive

qualitative approach with a case study design focused on the research site at Tinokkah Public Elementary School No. 104332. The study employs primary data gathered directly through field research, incorporating participant observation during live classroom sessions, as well as in-depth interviews with the IRE teacher and the school principal. To ensure data validity and accountability, a data translation technique is applied to cross-check credibility through two triangulation methods.

Through source triangulation, the author compares and cross-references the interview results from the IRE teacher with the principal's accounts and direct feedback from the students. Through technical triangulation, the author cross-checks the interview data against concrete evidence from classroom observation sheets and physical documentation of media usage obtained at the research site.

Through this methodological approach, teachers are expected to be more adaptive and innovative in developing technology-based learning media, such as educational videos, digital-based learning applications, and other information and communication technology tools. This aligns with the principles of the *Kurikulum Merdeka* (Independent Curriculum), which emphasizes the vital importance of digitalization in education. (Rosiana & Iskandar, 2025). To address the challenges of the current digital era, teachers must possess the creativity to deliver instructional materials in a way that is more engaging, interactive, and relevant to the world of children(Agustin et al., 2026).

Normatively, Islam encourages humans to think and act creatively, where Allah SWT constantly urges His servants to optimize their intellectual potential through His word in Surah Al-Baqarah (2:219):

يَسْأَلُونَكَ عَنِ الْخَمْرِ وَالْمَيْسِرِ ۖ قُلْ فِيهِمَا إِثْمٌ كَبِيرٌ وَمَنَافِعُ لِلنَّاسِ وَإِثْمُهُمَا أَكْبَرُ مِنْ نَفْعِهِمَا ۗ وَيَسْأَلُونَكَ مَاذَا يُنْفِقُونَ قُلِ الْعَفْوَ ۗ كَذَٰلِكَ يُبَيِّنُ اللَّهُ لَكُمُ الْآيَاتِ لَعَلَّكُمْ تَتَفَكَّرُونَ

Artinya: “Thus doth Allah make clear to you His Signs; in order that ye may consider.” (Q.S. Al-Baqarah [2]: 219)

The verse above explains that Islam provides ample space for its followers to cultivate creativity by utilizing both their intellect and conscience to solve life's challenges, including those within the realm of education (Musyafa, 2025).

Creativity in this study is directed toward the creative capacity of the IRE teacher to effectively utilize technology in alignment with learning media. These learning media encompass audio, visual, and audio-visual media (Silahuddin, 2022).

The utilization of technology such as the development of educational videos, interactive applications, and other digital platforms has proven to enhance the effectiveness of material delivery and broaden students' horizons (Asnawati, 2019).

Therefore, it is essential for teachers to possess digital competence to facilitate students in the learning process. Essentially, the utilization of these media strengthens student engagement with the religious materials being taught (Mufarrihah et al., 2023).

However, teachers are required to responsibly manage these technological media; without adequate supervision, the use of digital media could potentially lead to negative impacts (Sukriadi et al., 2026 :13).

Although studies regarding the digitalization of Islamic Religious Education (IRE) have been widely conducted, most prior research tends to focus on schools in urban areas that are already infrastructure-wise well-established. The research conducted by Suryani (2024) In reality, however, many Islamic Education teachers still struggle to optimize technology in their classrooms, hindered by limited skills, inadequate facilities, and a lack of support from their environment. providing evidence that the effectiveness of IRE digital visualization heavily depends on internet network stability and the completeness of school computer laboratories conditions that are ideal in urban areas but difficult to implement in rural or remote schools. Similarly, the research conducted by Prasidik (2017) revealing that research on the digital literacy of IRE teachers often loses its relevance when faced with the reality of schools facing a shortage of mobile phones or digital applications.

This is precisely where the research gap lies that this study aims to address. Little literature has explored the mechanism of teacher creativity in maintaining and innovating amid dual constraints: limited school infrastructure and personal digital competence in rural settings. The case of Tinokkah Public Elementary School Number 104332 presents an intriguing phenomenon worthy of scientific investigation. It

offers unique insights into the integration of laptops and the internet, which are just beginning to enter Tinokkah Village, Sipispis District, capturing an implementation that resides in a dilemmas-ridden zone between high internal teacher motivation and tangible structural barriers in rural areas. Rather than merely describing the utility of technology, this study provides an argumentative analysis that bridges teacher creativity and the restrictions of a rural learning environment.

Based on classroom observations and in-depth interviews conducted with the Islamic Religious Education (IRE) teacher, the reality on the ground at the research site is clearly illustrated as follows:

> "I really want to present animated videos every time I enter the classroom because the children focus immediately when they look at the screen. The school has also allowed the use of the available projector. However, the obstacle is that my laptop often lags when playing high-resolution videos, and the internet signal at school frequently drops. As a result, I have to download the videos at home the night before, and if there is a power outage or a device malfunction in class, I am forced to go back to the printed textbooks." (Interview with IRE Teacher, Mrs. S, June 2026).

This data is further reinforced by observation results indicating supporting factors at the research site, particularly the teacher's willingness to engage in independent learning and the openness of the school management in providing facilities. Conversely, the inhibiting factors are dominated by the limited quantity of hardware devices, unstable internet access, and gaps in device operation proficiency experienced by senior teachers. These conditions provide clear evidence that teacher creativity and the utilization of learning technology play a vital role in determining the quality of Islamic Religious Education. Therefore, an in-depth analysis is required regarding the efforts needed to support teacher competence development and the provision of adequate facilities. Based on these discrepant conditions, the author discusses this phenomenon comprehensively in a scientific paper titled “Teacher Creativity and the Utilization of Learning Technology in Islamic Religious Education at Tinokkah Public Elementary School Number. 104332.”

Problem Formulation

In light of the aforementioned background, this study aims to address the following research questions:

1. In what ways do teachers demonstrate creativity when utilizing technology for Islamic Education learning at at Tinokkah Public Elementary School Number. 104332?
2. How effective is the Islamic Education learning process after integrating technological media into the classroom at Tinokkah Public Elementary School Number. 104332?
3. What supporting and hindering factors do teachers encounter when implementing technology in Islamic Education lessons at Tinokkah Public Elementary School Number. 104332?

Research Purposes

This study is systematically aimed at answering the aforementioned problem formulations, specifically:

1. To explore and comprehensively describe how teachers demonstrate creativity when utilizing technology for Islamic Education learning at Tinokkah Public Elementary School Number. 104332.
2. To assess the effectiveness of the Islamic Education learning process after integrating technological media into the classroom at Tinokkah Public Elementary School Number. 104332.
3. To identify and break down the driving and hindering factors encountered by teachers when implementing technology in Islamic Education lessons at Tinokkah Public Elementary School Number. 104332.

Research Contributions

This research is anticipated to offer significant contributions to the world of Islamic education, spanning both theoretical and practical dimensions.

Theoretical Contributions This study aims to enrich academic literature and intellectual discourse on fostering teacher creativity and embedding information technology within primary-level Islamic Education. It is also intended to act as a scholarly reference for future researchers exploring similar fields of study.

Practical Contributions

- For Islamic Education Teachers at Tinokkah Public Elementary School Number. 104332: This research offers valuable insights for self-evaluation, motivation, and inspiration to boost innovative teaching and technical skills, ultimately fostering more interactive digital classrooms.
- For School Administrators: The insights gained from this study can assist in strategic decision-making and policy formulation, especially concerning the investment in educational technology and organizing digital upskilling programs for the teaching staff.
- For Students: The implementation of these findings will indirectly enhance students' learning journeys, spark their academic enthusiasm, and make abstract religious concepts easier to grasp through engaging visual and audio-visual media.

Method

This study utilizes a descriptive method with a qualitative approach to provide a systematic, factual, and in-depth description regarding the phenomenon of teacher creativity in utilizing IRE technology at Tinokkah Public Elementary School No. 104332. This school is located in Tinokkah Village, Sipispis District, Serdang Bedagai Regency, North Sumatra. According to Sugiyono (2020) defines the qualitative approach as a method for investigating natural conditions, wherein the researcher serves as the key instrument.

Anggito & Setiawan (2018) state that this method yields descriptive data consisting of written or oral words from the observed participants.

adds that this method aims to provide descriptive data regarding written or spoken words from the subjects, as well as behaviors observed directly in the field. This field research was conducted intensively over a three-month period (May 21 – July 21) during the even semester of the 2025/2026 academic year. The selection of research subjects or informants was carried out using a purposive sampling technique, with the primary criteria being informants who are directly involved in the school's digitally-based learning process and those responsible for teaching IRE.

The informants in this study consisted of six individuals: one school principal as the policymaker and provider of digital facilities in the school; two IRE teachers as the primary actors integrating technology and learning media in the classroom; and three 6th-grade elementary school students as the learners directly experiencing the impacts of technology utilization. These 6th-grade students were selected and recommended directly by the teachers based on the consideration that they possess mature communication skills to provide feedback and evaluations regarding the instructional media used by the teachers.

The data collection procedures were executed systematically and structurally through three main stages adapted from Creswell & Creswell (2022):

The pre-fieldwork stage involves administrative processing, such as obtaining research clearance, conducting a literature review, and performing initial observations to gain an overview of the school's general conditions. During this stage, the researcher designed the research instruments, including interview guides and observation sheets, derived directly from the operational indicators of teacher creativity and technology utilization variables.

In the implementation stage which focuses on data collection the researcher directly entered the field to gather empirical data. Direct observations were conducted across four sessions of 6th-grade IRE classes to observe firsthand how the teacher operates learning media and how the students respond.

In-depth interviews were conducted to explore aspects of creativity, technical constraints, and the teacher's strategies in navigating limited facility availability in rural areas. Meanwhile, documentation served as the process of gathering authentic evidence, including teaching modules, lesson plans, learning media files used by the teacher, and photographic documentation of teaching and learning activities. Finally, the data analysis stage was carried out inductively, referencing the data analysis model proposed by

Result and Discussion

Teacher Creativity in Utilizing Learning Technology for Islamic Education at SDN Tinokkah No.104332

Based on the research findings obtained from field data gathered through interviews and

observations at Tinokkah Public Elementary School No. 104332, the creativity of the IRE teacher goes beyond the confines of the classroom; rather, it emerges as a form of pedagogical resilience. The IRE teacher at this school is able to break away from the monotony of conventional methods by independently producing media through PowerPoint presentations and screening Islamic educational videos. Statements from the School Principal, Mrs. SP, and the IRE teacher, Mrs. SG, confirm a critical awareness that packaging religious materials digitally is an imperative implementation in the *Kurikulum Merdeka* (Independent Curriculum) era to maintain students' enthusiasm for learning.

When connected to prior literature, this finding demonstrates a unique novelty. Research conducted by Fajtriansyah & Merlianda (2025) suggests that teachers' digital creativity optimally surfaces only when supported by the seamless integration and availability of devices. However, the reality observed by the researcher at the study site highlights a contrasting dynamic: teacher creativity is born not from an abundance of facilities, but rather from limitations. The teacher tactfully makes modifications utilizing personal devices, such as personal laptops, portable speakers, and self-funded internet data packages.

This data reinforces the theoretical arguments of the research findings by

The teacher tactfully makes modifications utilizing personal devices, such as personal laptops, portable speakers, and self-funded internet data packages. This data reinforces the theoretical arguments of the research findings by Silahuddin (2022) who classifies learning media as inherently flexible, allowing it to be realized through the substitution of teachers' personal devices if institutional facilities remain inadequate. Within the context of Tinokkah Public Elementary School No. 104332, the teacher's creative energy is largely consumed by navigating technical issues rather than exploring deeper digital content variations.

Although the teacher has demonstrated creative initiatives, the effectiveness of classroom utilization still collides heavily with the infrastructural realities in Sipispis District. In this regard, the 6th-grade elementary students stated that 'they had learned using cartoon videos before, but not frequently due to network difficulties.' This dilemmatic condition prompts a critical dialogue with the prior study conducted by Afra (2025:73).

In their study, Afra (2025:73) emphasizes that consistently screening animated videos of prophetic stories and conducting visual discussions are proven to elevate student learning attention to the highest level. However, the researcher found that at the research site, the positive effects of such visual media are sporadic and easily diminished due to environmental stability factors.

Upon further analysis, this study identifies an imbalance within the digital ecosystem. The low digital literacy among some senior teachers in operating devices, coupled with poor internet connectivity in rural areas, leaves innovations based on the *Kurikulum Merdeka* hampered. This finding aligns with the critique from Mahmudah (2026) who states that without mature infrastructure management and oversight, technology in schools will trigger unpredictability in the learning environment. The strenuous efforts of the IRE teacher at Tinokkah Public Elementary School Number 104332 to overcome these limitations should not be viewed merely as a professional obligation, but rather as a tangible manifestation of the internalization of theological values.

The teacher's effort to download animated videos at home at night represents a concrete practice of moral responsibility to ensure that the core values of IRE learning are effectively transmitted to the digital generation. In accordance with the interpretation presented by Musyafa (2025) concerning the creativity of intellect (*'aql*) and heart (*qalb*), the teacher's struggle at this research site constitutes a form of 'literacy jihad.' When the IRE teacher endeavors to visualize abstract religious concepts through PowerPoint slides or videos amidst a scarcity of facilities, they are actualizing the status of knowledge (*darajah al-'ilm*) in accordance with the modern era.

Therefore, this analysis establishes a new theoretical position: in rural schools, spiritual and theological dimensions act as the primary catalyst that prevents teacher creativity from reaching burnout due to structural barriers.

Overall, the research conducted within this subsection successfully refutes the unilateral conclusions of several literaturic sources claiming that teachers in remote areas lack innovation. The research carried out by the investigator proves that the primary variable lies not in low teacher interest or creativity, but rather in the fragility of regional infrastructure.

As a logical implication, the emerging creativity of the IRE teachers at Tinokkah Public Elementary School Number. 104332 cannot endure if left to operate in isolation without external support. The school requires sustainable policy intervention, ranging from digital training focused on data-efficient media utilization to the provision of a stable local internet network by the relevant authorities.

The Effectiveness of Islamic Education Learning Following the Implementation of Technological Media in the Teaching and Learning Process at SDN Tinokkah No.104332

In the world of modern education, learning effectiveness is frequently utilized as the primary indicator to measure the success of the teaching and learning process (Fathurrahman et al., 2019).

This concept of effectiveness fundamentally examines the extent to which learning objectives can be optimally achieved, in terms of material comprehension, active student engagement, and final evaluation results. According to Hasibuan (2019) this effectiveness is influenced by numerous external and internal factors, ranging from the approach employed by the teacher and the variety of media to the students' own readiness. Amidst the onslaught of the digital era, deploying technology is no longer a mere option; rather, it is a crucial strategy to bolster this effectiveness, particularly for IRE subjects that frequently require contextual and inspiring approaches.

Hawa (2025) reaffirms that the utilization of technology in IRE classrooms is proven to revitalize the learning atmosphere, making it more dynamic, interactive, and engaging. Through visual, audio, and audiovisual stimulation, Islamic values which were previously dense with abstract theories can be visualized more concretely.

To assess the extent to which this effectiveness manifests at Tinokkah Public Elementary School Number. 104332, the researcher conducted in-depth interviews and direct observations. Interestingly, a slight divergence in perspective emerged between the school management and the practical implementation on the ground (Azizah & Sulisno, 2025). Mrs. SP, as the school principal, perceived that 'this implementation is not yet fully effective across the board, but it has shown rapid progress' due to facility constraints. Meanwhile, Mrs. SD, as the IRE teacher, assessed this method as 'quite effective' given the characteristics of today's students, who are highly visual learners. This statement was validated by feedback from the 6th-grade students, who admitted, 'When things are explained only orally, we often get confused and sleepy, but when we watch religious cartoon videos and PowerPoint presentations through the projector, we understand immediately and stay focused.'

When the findings obtained by the investigator are juxtaposed with prior research, there is an engaging space for discussion to explore:

- Synergy with Prior Research by Asnawati (2019): The findings at Tinokkah Public Elementary School No. 104332 align with the prior researcher's initial thesis, which asserts that direct visual media can effectively bypass student boredom. The transition from the teacher's verbal narratives to projector-based screenings is proven to elevate focus and facilitate the internalization of abstract materials, such as prophetic stories and concepts of Islamic ethics (*akhlak*), among 6th-grade students.
- Divergence from Prior Research by Ahmad (2018) On the other hand, the investigator identifies a distinct divergence that refines Ahmad's study regarding the effectiveness of digitalization in elementary schools. Ahmad suggests that the effectiveness of instructional technology will drop drastically if the school's infrastructure is inadequate. However, the case at Tinokkah Public Elementary School demonstrates that learning effectiveness can be sustained at a "quite effective" level, owing to the high level of teacher resilience. Although the internet network in Sipispis District frequently fluctuates rendering the use of cartoon videos sporadic the teacher's persistence in downloading materials at home beforehand successfully rescues the learning process from operational failure.

Based on the analysis above, the researcher argues that the effectiveness of IRE learning at Tinokkah Public Elementary School falls under the status of "Conditionally Effective." This implies that while technology successfully enhances the students' cognitive-psychological aspects, this effectiveness remains hindered by structural dimensions, namely unevenly distributed facilities and the digital literacy of some senior teachers, which still requires improvement (Azizah & Sulisno, 2025).

Berikut adalah hasil terjemahan penutup bab pembahasan Anda ke dalam bahasa Inggris akademik yang formal, kritis, dan mengalir secara natural (*smooth & fluid*):

When examined through the lens of Islamic Religious Education, achieving a "quite effective" level amidst limited facilities represents a tangible manifestation of a wise dawah strategy (*hikmah*). When the IRE teacher at Tinokkah Public Elementary School takes the initiative to bring a personal laptop and navigate the poor signal to display Islamic cartoon videos, this step embodies an adaptive means (*wasilah*) tailored to the modern era. The teacher recognizes that forcing conventional or lecture-based methods upon a visual generation would instead distance them from the essence of IRE materials.

The new theoretical contribution offered by this analysis refines the perspective on evaluating learning effectiveness in rural environments. Effectiveness cannot be rigidly measured solely by the sophistication of the devices used, but rather by the teacher's ability to contextualize media amidst limitations. The creativity demonstrated by the teacher at Tinokkah Public Elementary School proves that technical limitations can be compensated for by strategic instructional intelligence. Consequently, the objective of the *Kurikulum Merdeka* to foster interactive classrooms can still be fully realized.

Facilitating and Hindering Factors Faced by Teachers in Integrating Technology into Islamic Education at SDN Tinokkah No.104332

The utilization of technology in education does not fundamentally stand in isolation; rather, its success is invariably influenced by the interplay between various internal and external variables (Subhan et al., 2025). In this regard, Sa'bani (2025) explains that supporting factors such as teachers' psychological readiness, facility availability, school management support, and intensive training serve as the primary fuel for classroom digitalization. Conversely, SM (2024) provides a mapping indicating that limited infrastructure, low educator digital literacy, and the absence of a stable internet network constitute the most frequently encountered stumbling blocks. The successful integration of technology into this religious education demands an organic synergy between the quality of human resources, infrastructural readiness, and adaptive school management governance (Juliani et al., 2026).

Based on the empirical data gathered by the investigator through observation and in-depth interviews at Tinokkah Public Elementary School, the researcher discovered that idealistic-spiritual driving factors must clash directly with structural-technical barriers.

The most prominent supporting factor identified on the ground is the high level of leadership commitment from the school management, coupled with the strong internal motivation of the IRE teachers to break free from conventional methods. This is confirmed by the statement of the school principal, Mrs. SP, during an interview session as follows:

> "We do encourage teachers to utilize technology, even though not all classrooms have their own devices yet. However, we arrange a rotation system so that everyone can experience it." (Interview, June 2026).

This tactical policy by the principal was positively received by Mrs. SG and Mrs. SD as the IRE teachers. Both teachers emphasized that external demands and the *Kurikulum Merdeka* have transformed into personal awareness to continuously enhance their professional competence.

This positive synergy between the principal and the teachers is further reinforced by the psychological response of the students. An interview with a 6th-grade student revealed that the presence of technology in the classroom provides a high level of learning stimulation. Theologically, this movement for change initiated from within the school ecosystem precisely aligns with the tenets of Islamic education.

Theologically, this movement for change initiated from within the school ecosystem precisely aligns with the principles of Islamic education (Ma'arif et al., 2026). Thus, the attribute of *Ulul Albab* within the context of Tinokkah Public Elementary School is reflected in the open-minded attitude of the teachers, principal, and students, who are not anti-technology but instead view digital devices as a modern medium (*wasilah*) to capture wisdom (*hikmah*) and deepen religious knowledge more qualitatively.

However, this theological optimism and high internal motivation must confront an unfavorable field reality. Observation data gathered by the investigator reveals a fragile

regional infrastructure in the Sipispis District, which directly dampens the pace of teacher innovation. The primary hurdles stem from the limited quantity of digital devices and the unpredictability of the internet network. Mrs. SP, as the school principal, elaborated on these constraints:

> "Of course, there are still constraints. One of them is indeed regarding the facilities. Not all classrooms have their own equipment, such as LCDs, active speakers, or laptops. Therefore, teachers must take turns using them. Furthermore, the internet network is sometimes unstable. So, when teachers want to play videos or access online materials, they are frequently disrupted." (Interview, June 2026).

Furthermore, the school principal highlighted the digital skill gap or operational competence disparities, particularly among the senior generation of teachers:

> "Some teachers, especially the seniors, still experience quite some difficulty in utilizing technology. For instance, they require more time to prepare materials in PowerPoint format or to search for instructional videos. Nevertheless, we continuously encourage them and provide gradual training so everyone can adapt, especially since this is part of the current *Kurikulum Merdeka* mandates." (Interview, June 2026).

This limitation in technical competence was also personally felt by Mrs. SD, a senior teacher who is currently "still continuously learning, and occasionally confused when the equipment fails to operate due to signal disruptions"; however, driven by internal motivation, Mrs. SD persistently engages in collaborative learning.

The impact of these limited facilities ultimately contributes to access uncertainty for the students. The investigator captured this situation through a complaint from a student who failed to enjoy the visual facilities due to the necessity of yielding to other classrooms.

Confronting these exhausting technical clashes, the ecosystem at this research site eventually constructed a spiritual fortress to avoid falling into occupational burnout.

When juxtaposed with prior studies, the dynamics occurring at Tinokkah Public Elementary School bring to light an intriguing academic discourse to be discussed:

Berikut adalah hasil terjemahan kedua poin diskusi akademik tersebut ke dalam bahasa Inggris ilmiah yang formal, tajam, dan mengalir secara natural (*smooth & fluid*):

- Synergy and Theoretical Reinforcement from Ma'arif (2026): The empirical findings regarding the challenges at Tinokkah Public Elementary School reinforce the research conducted by Ma'arif. Prior studies assert that technological penetration in schools will never progress smoothly if the internet network and teachers' digital literacy remain at a low level. The technical barriers observed on-site namely the poor signal in the Sipispis area and the operational challenges faced by senior teachers at Tinokkah Public Elementary School prove that this issue constitutes a pervasive pattern commonly found in rural regions of Indonesia.
- Opposition and Theoretical Refinement of Meliza (2024): To a certain extent, the findings of this study refute and refine the rigid assumptions proposed by Meliza. Prior research argues that successful technological integration absolute requires mature synergy from infrastructural readiness from the outset; if the infrastructure is inadequate, the technological integration is deemed a failure.

Conversely, the research outcomes at Tinokkah Public Elementary School demonstrate a different pattern; technological integration did not fail entirely, but rather gave rise to the concept of *Pedagogical Bricolage*—the ability to utilize whatever resources are available (Bacq et al., 2015). Although the school's infrastructure is fragile and unevenly distributed across classrooms, digital-based learning remains functional and beneficial for students, sustained by the teachers' high internal motivation and the rotation system for device utilization organized by the principal.

The novel contribution offered by this study is the discovery of the concept of infrastructure resilience based on spiritual compensation. In rural schools like Tinokkah Public Elementary School, when technological infrastructure goes down due to poor signals, the innovation process does not abruptly grind to a halt. Consequently,

this study reaffirms that within a rural Islamic religious education ecosystem, the variable of teacher spirituality serves a crucial managerial function in sustaining the continuity of instructional technological innovation.

Conclusioon

Based on the research findings and discussion, it can be concluded that the utilization of instructional technology in IRE learning at Tinokkah Public Elementary School Number 104332 falls under the status of "Conditionally Effective" (*Conditional Effectiveness*). Teacher creativity in this rural area does not stem from facility capabilities, but rather manifests as pedagogical resilience (*creativity by restriction*). Teachers are able to break free from monotonous routines through the independent creation of PowerPoint media and screenings of religious animated videos using personal devices. Psychologically and cognitively, this digital intervention is proven to effectively skyrocket student attention and facilitate their understanding of abstract religious materials. Structurally, however, its optimization remains hindered by the digital skill gap among senior teachers, the limited quantity of school devices, and the fragile regional internet network infrastructure.

As a scientific contribution and a practical solution to these limitations, this study formulates the following realistic, staged recommendations:

Short-Term Phase The school needs to implement an *Asynchronous Digital Repository* system or establish an offline-based "Digital Content Bank." IRE teachers are advised to download materials, animated videos, and presentation slides at home or in areas with stable connectivity during the evening, and subsequently store them in flash drives or the school's external hard drives. This step effectively eliminates instructional dependency on the fluctuating internet network in the Sipispis District during school hours.

Medium-Term Phase The school principal needs to initiate a structured *Peer-Tutoring Program*, wherein teachers with more mature digital literacy regularly mentor senior teachers in developing simple digital modules. Additionally, the school management must formulate a strict scheduling system for LCD projector and laptop utilization, integrated into the weekly academic calendar, to minimize device queuing and access conflicts between classrooms.

Long-Term Phase In terms of policy implications, a reorientation of the School Operational Assistance budget allocation is recommended, shifting focus toward procuring low-power, essential digital devices. Furthermore, the relevant Department of Education is expected to stop standardizing digital training models between urban and rural schools; instead, they should design specialized training that focuses on instructional strategies based on compensating for limited facilities (*bricolage pedagogy*).

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