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THE EFFECTIVENESS OF EDUCATIONAL TECHNOLOGY IN IMPROVING STUDENTS' UNDERSTANDING IN ISLAMIC EDUCATION (PAI) AT MA AL-MUCHTARI, BOGOR REGENCY

Dian Nurdiani[1], Ahmad Sujai[2], Riri Suprihatin[3]
Postgraduate Study Program of Al-Karimiyah Islamic University of Depok (UID)[1,2,3]
Email: diannurdiani79@gmail.com[1], sujaidepok@gmail.com[2], ririsuprihatin28@gmail.com[3]

Keywords

PAI Technology, Learning Comprehension, Gibson's Effectiveness, Qualitative

Abstract

Islamic Religious Education (PAI) in Senior Islamic High Schools (Madrasah Aliyah) plays a vital role in shaping character and Islamic understanding. However, conventional learning centered on lectures and rote memorization triggers boredom and low comprehension of abstract materials. At MA Al-Muchtari, Bogor Regency, over 65% of students struggle with PAI, scoring an average of 60–65. Digital technology integration serves as a strategic solution to present PAI materials visually, interactively, and contextually. This study analyzes the implementation of instructional technology to improve PAI comprehension at MA Al-Muchtari based on James L. Gibson's effectiveness theory, covering six indicators: clarity of goals, strategies, policy formulation, planning, programs, and infrastructure. The focus examines pedagogical and managerial dynamics in overcoming learning barriers. Using a descriptive qualitative approach, this study explores students' experiences and teachers' challenges. Data were collected through classroom observations, in-depth interviews, and lesson plan (RPP) documentation to thoroughly evaluate the digital transformation process. The results show that interactive media (Canva, YouTube, Quizizz) effectively boost participation and visualize abstract topics. The smartphone ban positively maintained student focus through shared screens (projectors). Teacher competence was supported via MGMP forums, workshops, and lesson plans with manual backups.Overall, PAI technology integration is pedagogically and managerially effective. The main obstacles are limited equipment (2 projectors for 3 classrooms) and unstable Wi-Fi. Expanding digital hardware and internet access is recommended for optimal outcomes.

Teknologi PAI, Pemahaman Belajar, Efektivitas Gibson, Kualitatif

Pendidikan Agama Islam (PAI) di Madrasah Aliyah memegang peranan vital dalam pembentukan karakter dan pemahaman keislaman. Namun, pembelajaran konvensional yang berpusat pada ceramah dan hafalan memicu kebosanan serta rendahnya pemahaman terhadap materi yang abstrak. Di MA Al-Muchtari, Kabupaten Bogor, lebih dari 65% siswa mengalami kesulitan dalam PAI, dengan rata-rata nilai berkisar antara 60–65. Integrasi teknologi digital hadir sebagai solusi strategis untuk menyajikan materi PAI secara visual, interaktif, dan kontekstual. Penelitian ini menganalisis implementasi teknologi pembelajaran untuk meningkatkan pemahaman PAI di MA Al-Muchtari berdasarkan teori efektivitas James L. Gibson, yang mencakup enam indikator: kejelasan tujuan, strategi, perumusan kebijakan, perencanaan, program, dan

infrastruktur. Fokus penelitian ini mengkaji dinamika pedagogis dan manajerial dalam mengatasi hambatan belajar. Menggunakan pendekatan kualitatif deskriptif, penelitian ini mengeksplorasi pengalaman siswa dan tantangan guru. Data dikumpulkan melalui observasi kelas, wawancara mendalam, dan dokumentasi rencana pelaksanaan pembelajaran (RPP) untuk mengevaluasi proses transformasi digital secara menyeluruh. Hasil penelitian menunjukkan bahwa media interaktif (Canva, YouTube, Quizizz) secara efektif meningkatkan partisipasi dan memvisualisasikan topik-topik abstrak. Larangan penggunaan telepon seluler secara positif mampu menjaga fokus siswa melalui pemanfaatan layar bersama (proyektor). Kompetensi guru didukung melalui forum MGMP, lokakarya, serta RPP dengan cadangan manual. Secara keseluruhan, integrasi teknologi PAI efektif secara pedagogis dan manajerial. Kendala utamanya adalah keterbatasan perangkat (2 proyektor untuk 3 ruang kelas) serta jaringan Wi-Fi yang tidak stabil. Perluasan perangkat keras digital dan akses internet direkomendasikan untuk mencapai hasil yang optimal.

1. INTRODUCTION

Islamic Religious Education (IRE) in madrasah aliyah (Islamic senior high schools) plays a crucial role as a primary pillar in shaping student character—fostering individuals who not only comprehend teachings theoretically but are also capable of implementing the values of creed (aqidah), ritual worship (ibadah), morality (akhlaq), and social transactions (muamalah) in daily life. The national curriculum mandates meaningful and applicable learning, steering students away from mere mechanical rote memorization toward deep conceptual understanding. However, field realities demonstrate that achieving these objectives is frequently hindered by various structural and pedagogical obstacles that impede the effective transfer of religious knowledge to learners.

The primary challenge in IRE instruction stems from the dominance of conventional methods, such as one-way lecturing and manual assignments, which leave students feeling fatigued, apathetic, and struggling to comprehend abstract materials such as Islamic monotheism (tauhid) or Islamic jurisprudence (fiqh muamalah). This condition is exacerbated within resource-constrained private madrasahs, where teachers are frequently overwhelmed and display minimal instructional innovation. This phenomenon culminates in low knowledge retention and average IRE grades falling below minimum competency standards, as widely observed across Islamic educational institutions in the West Java region.

As a transformative solution, the utilization of digital learning technology offers substantial opportunities to enhance motivation and accommodate diverse student learning styles through gamification, visual animated videos, and interactive platforms. In the post-pandemic era, this technological integration should ideally bridge student comprehension of religious concepts contextually and in real time. Nevertheless, the availability of technological devices in schools does not automatically guarantee pedagogical success if their application is limited to merely transferring text material onto a screen without fundamental instructional strategy restructuring.

A similar and more complex dynamic is evident at Madrasah Aliyah (MA) Al-Muchtari, Bogor Regency, where preliminary studies reveal that more than 65% of students in grades 10 to 12 experience learning difficulties in IRE, with daily examination scores ranging from 60 to 65. Although the school possesses basic facilities such as projectors and computer laboratories, their utilization remains exceedingly minimal due to resistance from under-trained teachers and a tendency for students to be distracted by personal mobile devices. This issue is compounded by the fact that the school administration has yet to establish a targeted technological policy, teacher quality remains below average, student learning interest is low due to exhaustion from outdated models, and supportive infrastructure for digital interaction remains inadequate.

To systematically dissect the complexity of this phenomenon, this research employs Gibson's Effectiveness Theory as an analytical lens, highlighting various critical dimensions within educational organizations. Grounded in this framework, the core problem is examined in depth through the dimensions of technological objective clarity, strategic clarity, policy analysis and formulation processes, program planning, operational program development, and the availability of infrastructure and facilities. These dimensions serve as an essential foundation for evaluating the extent to which technological interventions can be optimally managed to boost student comprehension.
Stemming from this background and problem identification, this qualitative study aims to comprehensively uncover and analyze all dimensions of Gibson's effectiveness at MA Al-Muchtari. Through this approach, the researcher not only measures numerical achievements but also captures empirical processes, teacher and student barriers, and the actual learning experiences shaped through the utilization of instructional technology to enhance comprehension quality in IRE subjects

2. METHODS

This study employs a descriptive qualitative approach to examine the effectiveness of utilizing technology in enhancing student comprehension of Islamic Religious Education (IRE) subjects at MA Al-Muchtari (Murdiyanto, 2020). The research data comprise primary data elicited directly through structured interviews with the school principal, teachers, and students, alongside passive participant observation, as well as secondary data consisting of curriculum documents and madrasah archives. The research variables are operationalized based on Gibson's (2005) Effectiveness Theory, which encompasses six dimensions: goal clarity, strategic clarity, policy analysis and formulation processes, planning, program development, and the availability of infrastructure and facilities. All data were collected through a combination of in-depth interviews, field observations, and documentary studies (Burhan, 2003).

The data analysis process follows the interactive model of Miles and Huberman, comprising three primary stages, commencing with data reduction to select, focus, and summarize field findings relevant to the research focus (Wahyu, 2010). The subsequent stage entails data display utilizing structured narrative descriptions to clearly map interrelationships among phenomena, culminating in conclusion drawing and verification to produce credible research findings. Through this analytical cycle, the researcher is able to comprehensively uncover the barriers, learning experiences, and implementation quality of IRE instructional technology at the research site (Sirajuddin, 2017).

3. FINDING AND DISCUSSION

Research Result

The application of technology in Islamic Religious Education (IRE) learning at Madrasah Aliyah (MA) Al-Muchtari, Bogor Regency, is rooted in the strong structural commitment of the madrasah leadership to build a shared perception among educators. This commitment is systematically manifested through policies directing the collaborative formulation of the Educational Unit Operational Curriculum (KOSP) and teaching modules. The objective is to ensure that every IRE teacher shares a harmonious orientation in utilizing digital media to concretize abstract religious materials, such as aqidah, tauhid, fiqh muamalah, and the history of Islamic civilization. Through the direct guidance of the madrasah principal, technological integration does not proceed partially; rather, it serves as a collective strategy fully integrated into daily

teaching and learning activities, ensuring that the direction and targets of madrasah quality achievement can be optimally measured.

Educators at this madrasah demonstrate a profound understanding of the pedagogical functions of technology in visualizing complex materials. The History of Islamic Culture subject teachers utilize YouTube videos, Canva presentation slides, and digital images to overcome the monotony of conventional lecturing methods, while other teachers integrate visual simulations of ritual processes to foster two-way classroom interaction. Some educators have even adopted artificial intelligence instruments to design more precise instructional media. The clarity of these objectives is also transmitted directly to students at the beginning of instruction, wherein teachers explain the purpose, benefits, comprehension targets, and digital collaboration ethics so that students understand the material comprehensively.

Alignment between the madrasah's vision and instructional practices is actualized through student-centered hardware and software utilization strategies. The combination of laptops, LCD projectors, and audio speakers is optimized to present dynamic visual materials, break the monotony of single-lecture methods, and stimulate active academic dialogue. The use of gamification-based evaluation platforms such as Quizizz transforms the classroom atmosphere into a more competitive and participatory environment, encouraging students to directly test their comprehension. Through this visualization and interactive quiz strategy, complex IRE materials are successfully translated into engaging learning experiences, significantly enhancing memory retention and active student engagement.

The policy analysis process at MA Al-Muchtari is confronted with unique dynamics due to the madrasah's status under the auspices of an Islamic boarding school (pesantren), which enforces strict regulations prohibiting students from bringing personal mobile devices into the school environment. Responding to these regulations, the madrasah formulated a transitional policy by centralizing technological facilities onto shared screens using school inventory and computer laboratories. This policy proved effective in eliminating potential digital distractions, such as social media or gaming addiction, while focusing the attention of all students on a single focal point of the material. Teachers subsequently implemented holistic supervision combining physical discipline, the cultivation of digital ethics, and a personal approach for passive students to maintain an inclusive classroom atmosphere.

The madrasah leadership, in collaboration with the Infrastructure unit, addressed the limited projector ratio by formulating periodic distribution scenarios and centralizing high-technology activities in the computer laboratory as a power center. To suppress potential teacher resistance, the leadership proactively engaged educators in periodic training through the Subject Teacher Association forum, encompassing Canva workshops, Quizizz, and AI utilization. Technical risk management aspects were also maturely anticipated through the allocation of preventive maintenance budgets, the installation of CCTV for asset security, and the standby deployment of an IT technician team to swiftly respond to sudden disturbances such as power outages.

Instructional planning at MA Al-Muchtari is meticulously designed into Lesson Plans and Teaching Modules, wherein teachers map out the flow of digital media utilization to align with Basic Competencies. Teachers carefully determine when video screenings, Canva presentations, or digital quizzes are incorporated into the stages of teaching and learning. Furthermore, to anticipate potential technical constraints such as server disruptions or power outages, teachers have prepared tactical contingency plans. When digital devices become inoperable, teachers immediately shift the instructional strategy to conventional whiteboard-based methods, direct practical demonstrations in front of the class, or group assignments based on Student Worksheets.

Teacher competency enhancement programs are implemented through a synergy between independent self-taught learning initiatives via YouTube and active participation in Subject Teacher Association forums and external seminars. This pattern ensures that teachers continuously update their digital pedagogical skills alongside contemporary developments. On the other hand, the learning effectiveness evaluation mechanism applied by the madrasah principal is conducted holistically through academic supervision and direct observation of classroom dynamics. The evaluation is not solely oriented toward quantitative grade achievements, but rather assesses increases in student enthusiasm, participatory engagement, and material absorption effectiveness as collective reflection material during monthly meetings.

The infrastructure and facilities at MA Al-Muchtari generally possess an adequate foundational setup, including Wi-Fi access, computer laboratories, and projector devices, although challenges remain regarding the device availability ratio in regular classrooms, which is managed through a rotational scheduling system. Incidental technical constraints such as fluctuating internet signals occasionally emerge;

however, the user-friendly interfaces of digital platforms like Canva and Quizizz enable both teachers and students to adapt rapidly. Student confirmations indicate that this multimedia integration successfully fosters an enjoyable learning environment, eliminates monotony, and sustainably reinforces deep comprehension of IRE materials.

Analysis of Research Findings Based on Gibson's Effectiveness Theory

This research analysis is conducted to measure the effectiveness of utilizing instructional technology in enhancing student comprehension of Islamic Religious Education (IRE) subjects at MA Al-Muchtari, Bogor Regency, with reference to James L. Gibson's organizational effectiveness framework. From Gibson's perspective, effectiveness is evaluated not merely by the achievement of final outcomes, but also entails the seamlessness of the integration process and the satisfaction levels of educational stakeholders involved. Grounded in empirical data, this analysis delineates the extent to which the utilization of digital media and technological tools can optimize the attainment of IRE learning objectives, stimulate active student engagement, and foster a conducive learning climate within the madrasah environment. All field findings are synthesized through an in-depth review of the six primary dimensions of the effectiveness theory, commencing from the alignment of institutional vision to the sustained psychological and pedagogical impacts experienced directly by the learners (James, 1996).

In Gibson's perspective, effectiveness originates from a shared perception and clarity of direction regarding targeted objectives. At the operational level in MA Al-Muchtari, this goal clarity is actualized through the structural commitment of the madrasah leadership, directing the collaborative formulation of the Educational Unit Operational Curriculum (KOSP) and teaching modules to concretize abstract IRE materials such as Monotheism (Tauhid) and Islamic Jurisprudence (Muamalah). This commitment is applied practically by IRE teachers such as Teacher 1's utilization of YouTube videos and Canva for History of Islamic Culture, Teacher 2's visual simulations of Islamic jurisprudence (fiqh), and Teacher 3's integration of artificial intelligence (AI) to visualize complex materials. Furthermore, this goal clarity is consistently transmitted to students at the onset of instruction, wherein teachers comprehensively explain the purpose, tool functions, and digital ethics.

Gibson emphasizes that organizational effectiveness is heavily determined by strategic clarity, which transforms fundamental visions into tangible, targeted, and

aligned operational steps at all levels. At MA Al-Muchtari, this strategic clarity is manifested through alignment between madrasah management policies and collaborative teacher practices in executing diverse hardware components—such as laptops and projectors—alongside interactive software like PowerPoint, Canva, and Quizizz. The implementation of this multimedia strategy has proven to yield significant dual impacts: an enhancement in students' cognitive retention regarding abstract materials and a surge in participatory engagement through competitive timed quiz formats. Moreover, purposeful technological utilization has successfully fostered self-directed learning beyond school hours, stimulating students' curiosity to independently explore religious literature.

The policy analysis and formulation process at MA Al-Muchtari reflects a systemic approach that adapts to resource constraints and the distinct characteristics of an institution under the auspices of an Islamic boarding school (pesantren). The madrasah leadership conducted an initial inventory to circumvent the limited projector ratio through a rotational system and the centralization of computer laboratories, while establishing strict non-BYOD regulations prohibiting the use of personal mobile devices to maintain boarding school discipline. To accommodate digital needs without violating regulations, the madrasah provides centralized shared screen facilities under the full control of teachers. Teachers subsequently implement holistic supervision that combines centralized visual attention, the cultivation of digital ethics, and personal approaches for passive students, thereby optimally eliminating potential digital distractions while accelerating teacher competency development through periodic Subject Teacher Association (MGMP) workshops.

The planning dimension at MA Al-Muchtari is actualized through the allocation of operational budgets for preventive hardware maintenance, the installation of CCTV for asset security, and the standby deployment of an IT technician team to swiftly respond to sudden technical disruptions. In the pedagogical planning aspect, IRE teachers have structurally integrated the flow of digital media into Teaching Modules and Lesson Plans (RPP), mapping every video screening or evaluation platform precisely to align with Basic Competencies. Furthermore, to anticipate potential crises such as power outages or server disruptions, teachers prepare tactical backup plans, ranging from shifting the instructional flow to whiteboards and textbooks, direct practical demonstrations in front of the class, to group assignments based on Student

Worksheets (LKPD).

Within Gibson's framework, long-term effectiveness is heavily determined by human resource capacity development and continuous evaluation mechanisms. At MA Al-Muchtari, this institutional commitment is actualized through the facilitation of periodic training programs and digital workshops via the MGMP, which train IRE teachers to master the creation of interactive media and artificial intelligence instruments. This capacity is reinforced by independent autodidactic learning initiatives undertaken by individual teachers to update their techniques for presenting religious materials. Meanwhile, the effectiveness evaluation mechanism is implemented by the madrasah leadership through academic supervision and direct observation of classroom dynamics, utilizing indicators of increased enthusiasm, participation, and material absorption as collective reflection materials during monthly meetings.

The infrastructure and facility availability aspect at MA Al-Muchtari reveals a combination of qualitative basic infrastructure feasibility and quantitative field challenges. The madrasah is equipped with Wi-Fi, computer laboratories, projectors, and modern interactive panels that are qualitatively highly reliable for supporting state-of-the-art learning applications. However, quantitatively, the limited projector ownership ratio (two units for three regular classes) necessitates meticulous rotational system management. Educator perception analysis indicates various technical constraints, ranging from fluctuating internet signals disrupting streaming displays to methodological challenges in designing precise integration of abstract materials. Nevertheless, core platforms such as Canva, Quizizz, and YouTube are perceived as highly user-friendly, enabling incidental barriers to be swiftly overcome through intuitive navigation.

The evaluation of this facility aspect also underscores a network performance disparity between the computer laboratory operating seamlessly as a learning resource center and regular classrooms that still encounter limited Wi-Fi coverage. Nonetheless, these infrastructure hurdles do not dampen student motivation, as interactive multimedia integration has proven to deliver profound satisfaction alongside exceptionally positive psychological and pedagogical impacts. Student feedback confirms that the integration of visual, audio, and gamification elements successfully eliminates the boredom and drowsiness frequently induced by conventional lecturing methods. This engaging learning experience enables students to feel comfortable,

remain focused, and maintain high enthusiasm for delving deeply into IRE subjects until the conclusion of the learning session.

Analysis of Research Findings Based on William N. Dunn's Policy Analysis Theory

Evaluation of the technology integration policy in Islamic Religious Education (IRE) learning at MA Al-Muchtari using William N. Dunn's framework of six indicators demonstrates an exceptionally high level of effectiveness and efficiency. In terms of effectiveness, the utilization of interactive media such as Canva, YouTube, and Quizizz has successfully visualized abstract and doctrinal materials—such as creed (aqidah), social transactions (muamalah), and the history of Islamic civilization—into more concrete and contextual forms, which significantly boosts active participation and critical thinking skills among students, as asserted by Azhar Arsyad. Meanwhile, from the aspect of efficiency, the madrasah is able to optimize limited resources through the use of non-paid digital platforms, the optimization of collective devices, and Subject Teacher Association (MGMP)-based internal training as well as independent learning without excessively burdening operational budgets, aligning with H.A.R. Tilaar's perspective on educational resource management (Azhar, 2014).

Nevertheless, evaluation on the aspects of adequacy and equity reveals structural challenges that still require remediation. The adequacy aspect of materials has successfully overcome student learning fatigue, yet the quantity of physical infrastructure—such as the regular classroom projector ratio (two units for three classes) and the stability of non-laboratory Wi-Fi networks—remains sub-optimally fulfilled, implying obstacles in achieving curriculum targets equitably, according to E. Mulyasa. This challenge is closely linked to the issue of equity, wherein maximum high-speed digital access is currently centralized in the computer laboratory, while regular classrooms still face facility limitations and the necessity of queueing for devices, meaning that the principle of equality of educational opportunity voiced by Suryadi has not yet been fully realized (Tilaar, 2009).

On the other hand, this policy records exceptionally positive levels of responsiveness and appropriateness. Responsiveness is evident in the high enthusiasm of learners toward interactive learning and the adaptive readiness of teachers in designing backup plans to anticipate technical constraints, in line with Oemar Hamalik's thought. Furthermore, this policy is highly appropriate and harmonious with the institutional culture of the pesantren through the enforcement of a non-BYOD rule

prohibiting personal mobile devices, substituted with a shared screen display system, enabling technological modernization to be successfully adopted without disrupting pesantren discipline and protecting students from negative distractions, confirming Sudarwan Danim's theory regarding local culture-based innovation.

Analysis of Research Findings Based on Neil J. Salkind's Statistical and Research Methods Framework

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven effective in bridging abstract materials into more concrete and contextual forms as cognitive stimulators for students (Wina, 2012). Interestingly, the pesantren regulations prohibiting personal mobile devices are instead optimally leveraged through a projector- or Smart TV-based shared screen strategy, which successfully centralizes collective attention and eliminates digital distractions (Arsyad, 2014). The success of this pedagogical transformation is also supported by management adaptability and the enhancement of teacher capacity through Subject Teacher Association (MGMP) forums and the preparation of contingency plans (backup plans), reflecting high managerial readiness in anticipating technical constraints (Neil, 2012) (Salkind, 2023).

Although pedagogical and managerial achievements are categorized as successful, the program's effectiveness has not reached its maximal level due to structural barriers in infrastructure and facilities (Hamzah, 2021). The disparity in projector availability ratios such as two units for three regular classes alongside fluctuations in Wi-Fi connectivity in regular classrooms constitutes a tangible challenge that hinders the optimization of outcomes (Salkind). In alignment with the perspective of Barnawi and Arifin, infrastructure equity is an absolute prerequisite; without adequate physical facility support, the full potential of digital media in enhancing learning quality will experience stagnation (Rusman, 2019).

Analysis of Research Findings Based on Sardiman A.M.'s Theory of Learning Interaction and Motivation

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven effective in bridging abstract materials—such as the concepts of monotheism (tauhid), social transactions (muamalah), and Islamic history—into tangible visual forms that stimulate students' extrinsic motivation and curiosity (Muhaimin, 2012). Furthermore, the pesantren policy

prohibiting personal mobile device ownership is instead optimized through a shared screen strategy utilizing projectors or Smart TVs. This approach successfully concentrates students' collective attention on a single focal point without digital distractions, enabling intensive and cohesive two-way educational interactions to be established (Ramayulis, 2015).

The success of this pedagogical transformation is likewise supported by teachers' professionalism in classroom management through the strengthening of Subject Teacher Association (MGMP) forums and the formulation of contingency plans (backup plans) to anticipate sudden technical constraints (Mulyasa, 2019). Nevertheless, the maximal level of effectiveness remains constrained by physical facility limitations, such as an unbalanced projector ratio (two units for three classes) and Wi-Fi network fluctuations in regular classrooms. Without equitable digital infrastructure and adequate facility support, the full potential of instructional media is feared to experience structural barriers in achieving equitable learning outcomes (Veithzal, 2017).

Analysis of Research Findings Based on Hamzah B. Uno's Motivation and Learning Theory

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven significantly capable of transforming abstract concepts such as monotheism (Tauhid), Islamic jurisprudence of social transactions (Fiqh Muamalah), and Islamic history into concrete and comprehensible visual materials (Oemar, 2017). Interestingly, the pesantren policy prohibiting students from bringing personal mobile devices serves as a distinct managerial advantage through the implementation of a shared screen strategy utilizing projectors or Smart TVs (Mulyasa, 2019). This approach successfully concentrates the collective attention of the class on a single focal point without triggering a breakdown in concentration caused by individual gadget distractions, thereby ensuring that instructional interactions proceed harmoniously and with clear direction (Hamzah B. Uno; Ramayulis).

The success of this instructional transformation is likewise supported by teachers' managerial resilience through active participation in Subject Teacher Association (MGMP) forums, workshop training, and the preparation of Lesson Plans (RPP) equipped with manual contingency plans (backup plans) to guarantee the

continuity of the learning process without interruptions (zero downtime). Nevertheless, the achievement of this systemic effectiveness remains hindered by physical facility limitations, such as the disproportionate projector ratio (two units for three classes) and fluctuations in Wi-Fi network stability within regular classrooms. Without equitable digital infrastructure and adequate facility support, the full potential of instructional media risks experiencing stagnation in achieving equitable learning outcomes for all students (Barnawi, 2015).

Analysis of Research Findings Based on Wina Sanjaya's Instructional Strategy Theory

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven significantly capable of transforming abstract cognitive concepts such as monotheism (Tauhid), Islamic jurisprudence of social transactions (Fiqh Muamalah), and the History of Islamic Civilization into concrete and meaningful visual materials (Arsyad, 2014). Interestingly, the pesantren regulation prohibiting students from bringing personal mobile devices serves as a distinct managerial advantage through the implementation of a shared screen strategy utilizing projectors or Smart TVs. This approach successfully concentrates students' entire attention and focus on a single focal point of instruction without being fractured by individual distractions, enabling group educational interactions to proceed in a conducive and directed manner (Sanjaya, 2021).

This instructional transformation is likewise supported by teachers' professionalism in classroom management through active participation in Subject Teacher Association (MGMP) forums, workshops, and the preparation of Lesson Plans (RPP) equipped with manual contingency plans (backup plans) to guarantee the continuity of the teaching and learning process amid potential technical constraints (Mulyasa, 2019). Nevertheless, the achievement of this systemic effectiveness remains constrained by structural barriers in physical infrastructure and facilities, such as the disproportionate projector ratio (two units for three classes) and Wi-Fi connection fluctuations in regular classrooms. Without equitable infrastructure and adequate facility support, the full potential of instructional media risks encountering obstacles in achieving optimal outcomes for all students (Sanjaya, 2021).

Analysis of Research Findings Based on Donald L. Kirkpatrick's Four-Level Training Evaluation Model

Evaluation at the first level (reaction) indicates that the utilization of interactive media such as Canva, YouTube, and Quizizz successfully triggered highly positive affective responses and enhanced student enthusiasm within the classroom. Uniquely, the pesantren regulations restricting the use of personal mobile devices were optimized through a shared screen strategy utilizing projectors or Smart TVs, thereby creating a distraction-free environment that directed collective attention centrally (Arsyad, 2014). At the second level (learning), the integration of this technology was proven to significantly facilitate the internalization of abstract IRE materials—such as the concepts of Monotheism (Tauhid), social transactions (muamalah), and Islamic history—into concrete visual forms that strengthen memory retention and conceptual comprehension among learners (Barnawi, 2015).

At the third level (behavior), effectiveness is manifested through changes in the professional behavior of IRE teachers, reflected in their active participation in Subject Teacher Association (MGMP) forums and workshops, as well as their readiness to formulate Lesson Plans (RPP) equipped with manual contingency plans (backup plans). The presence of this contingency planning proves that educators not only possess digital literacy but also demonstrate managerial maturity (adaptive behavior) to maintain the continuity of the instructional process so that it runs smoothly amidst potential technical constraints (Rivai, 2017).

At the highest level (results), the technology integration program at MA Al-Muchtari has generally succeeded in achieving its primary objective of realizing interactive and high-quality IRE instruction. Nevertheless, the optimal achievement of systemic impact remains hindered by structural barriers in physical infrastructure and facilities, such as the disproportionate projector ratio (two units for three classes) and Wi-Fi connection fluctuations in regular classrooms. Consequently, managerial support in the form of digital infrastructure equity and the fulfillment of technical facilities serves as an absolute prerequisite for ensuring that the ultimate outcomes of educational innovation can be sustainably experienced by all members of the school community (Barnawi, 2015).

Analysis of Research Findings Based on Daniel L. Stufflebeam's CIPP Evaluation Model

Context and input evaluation regarding the integration of IRE instructional technology at MA Al-Muchtari demonstrates a strong alignment between the need to visualize abstract materials such as Monotheism (Tauhid), Islamic Jurisprudence of Social Transactions (Fiqh Muamalah), and Islamic history and the distinctive regulations of the pesantren environment (Stufflebeam). The prohibition of personal mobile device ownership for students is addressed adaptively through a shared screen strategy utilizing projectors or Smart TVs, which harmonizes with sociological learning conditions (Arsyad, 2014). From the input dimension, human resource readiness is classified as exceptionally superior, reflected in the continuous enhancement of teacher competence through Subject Teacher Association (MGMP) forums, workshops, and the formulation of Lesson Plans (RPP) equipped with contingency plans (backup plans). Nevertheless, the input evaluation also identifies structural barriers in the form of an unbalanced projector device ratio (two units for three regular classes) alongside Wi-Fi network stability fluctuations in regular classroom areas, which potentially limit the optimization of technology utilization (Barnawi, 2015).

In the process evaluation dimension, the implementation of interactive platforms such as Canva, YouTube, and Quizizz has proven to run efficiently in maintaining student focus and active engagement while eliminating digital distractions caused by the absence of individual gadgets (Mulyasa, 2019). Teachers' managerial readiness in executing manual contingency plans during technical disruptions ensures the smooth flow of instructional interactions within the classroom. Meanwhile, product evaluation confirms that this program has successfully achieved its primary objective: realizing interactive IRE instruction, enhancing active participation, and clarifying the comprehension of complex religious materials. Based on Stufflebeam's framework, this program is deemed highly viable for continuation, with the caveat that modifications and optimizations are necessary regarding physical facility availability and internet network equity to ensure the long-term sustainability of effectiveness across the board (Rivai, 2017).

Analysis of Research Findings Based on Daniel L.'s Theory

Context and input evaluation regarding the integration of Islamic Religious Education (IRE) instructional technology at MA Al-Muchtari demonstrates a strong

alignment between the fundamental need to visualize abstract materials such as the concepts of Monotheism (Tauhid), Islamic jurisprudence of social transactions (Muamalah), and the history of Islamic civilization and the distinctive regulations of the pesantren environment (Stufflebeam). The prohibition of personal mobile device ownership for students is addressed adaptively through a shared screen strategy utilizing projectors or Smart TVs, which harmonizes with sociological learning conditions (Arsyad, 2014). From the input dimension, human resource readiness is classified as exceptionally superior, reflected in the continuous enhancement of teacher competence through Subject Teacher Association (MGMP) forums, digital workshops, and the formulation of Lesson Plans (RPP) equipped with manual contingency plans (backup plans). Nevertheless, the input evaluation also identifies structural weaknesses in the form of an unbalanced projector device ratio (two units for three regular classes) and Wi-Fi connection instability in regular classroom areas, which potentially limit the optimal utilization of technology (Barnawi, 2015).

In the process evaluation dimension, the implementation of interactive platforms such as Canva, YouTube, and Quizizz has proven to run extremely efficiently in maintaining student concentration, focus, and active engagement (Mulyasa, 2019). The use of shared screens proved successful in eliminating digital distractions caused by the absence of individual gadgets, while teachers' managerial readiness in executing manual contingency plans during connection disruptions ensures the smooth flow of instructional interactions. Meanwhile, product evaluation confirms that this program successfully achieved its primary objective (product achievement): realizing interactive IRE instruction, enhancing student participation, and clarifying the comprehension of complex religious materials. Based on Stufflebeam's framework, this program is deemed highly viable to maintain and continue, yet requires modifications and optimizations in the form of adding physical facilities and equalizing internet networks to ensure the long-term sustainability of maximum program effectiveness (Rivai, 2017).

Analysis of Research Findings Based on Richard E. Mayer's Cognitive Theory of Multimedia Learning

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven significantly capable of reducing extraneous cognitive load and visualizing abstract materials such as the concepts of Monotheism (Tauhid), Islamic jurisprudence of social transactions

(Muamalah), and Islamic historiography into solid mental representations through dual-channel visual and auditory pathways (Richard E. Mayer). Within the Problem-Based Learning (PBL) framework, this visualization of factual cases acts as a problem orientation that stimulates critical analysis without overloading students' working memory (Wina Sanjaya). Interestingly, the pesantren regulations prohibiting the use of personal mobile devices are instead optimized through a projector- or Smart TV-based shared screen strategy. This approach applies spatial and temporal contiguity principles, wherein visual information and explanations are presented simultaneously within a single collective focal space, thereby successfully eliminating the split-attention effect and building a cohesive group discussion atmosphere without non-academic distractions (Richard E. Mayer; Azhar Arsyad).

The success of this instructional transformation is likewise supported by the strategic role of teachers as instructional designers who actively develop competence through Subject Teacher Association (MGMP) forums, workshops, and the preparation of Lesson Plans (RPP) based on manual contingency plans (backup plans). This contingency scenario ensures that the problem-based learning structure continues to run smoothly despite technical constraints (Richard E. Mayer; E. Mulyasa). Nevertheless, the systemic effectiveness of this program still faces structural barriers in the form of a disproportionate projector availability ratio (two units for three regular classes) and Wi-Fi connection stability fluctuations in regular classroom areas. From the perspective of Mayer's theory, physical facility deficits and disruptions in media continuity can interrupt learners' cognitive processing flow. Therefore, network infrastructure equity and device allocation optimization by the madrasah management constitute an absolute prerequisite for ensuring that the full potential of multimedia learning can be utilized equitably and sustainably (Barnawi & Arifin).

Analysis of Research Findings Based on M. David Merrill's First Principles of Instruction

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven effective in implementing M. David Merrill's First Principles of Instruction, particularly through the principles of Demonstration and Activation, which transform abstract materials such as Monotheism (Tauhid), Islamic jurisprudence of social transactions (Fiqh Muamalah), and Islamic history into visual knowledge that is easily observable and critically analyzed (Hamalik,

2017) Interestingly, the pesantren regulations prohibiting personal mobile devices are instead optimized through a shared screen strategy utilizing projectors or Smart TVs. This approach successfully creates a distraction-free learning environment that fulfills the Application principle, enabling all students to interact collectively and in a directed manner in completing tasks or group quizzes without non-instructional distractions (Arsyad, 2014).

This instructional transformation is likewise supported by the teacher's role as a task-centered facilitator who actively develops competence through Subject Teacher Association (MGMP) forums, workshops, and the preparation of Lesson Plans (RPP) equipped with manual contingency plans (backup plans) to guarantee learning continuity amidst potential technical constraints (Mulyasa, 2019). Nevertheless, the achievement of maximal effectiveness culminating in the Integration principle, wherein students consolidate knowledge into their daily lives remains hindered by physical facility limitations, such as the disproportionate projector ratio (two units for three classes) and Wi-Fi connection fluctuations. Without equitable digital infrastructure and adequate facility support, the full potential of instructional media is feared to encounter obstacles in achieving equitable learning outcomes for all students (Barnawi, 2015).

Analysis of Research Findings Based on Lev Vygotsky's Sociocultural Theory of Development

The utilization of interactive media such as Canva, YouTube, and Quizizz in Islamic Religious Education (IRE) instruction has proven effective in visualizing abstract concepts such as Monotheism (Tauhid), social transactions (muamalah), and Islamic history as cultural tools that act as scaffolding to guide students across the Zone of Proximal Development (ZPD) (Wina, 2012). Interestingly, pesantren regulations prohibiting personal mobile devices are optimized through a shared screen strategy utilizing projectors or Smart TVs. This approach transforms individual interactions into socio-collective interactions from the interpsychological realm to the intrapsychological realm, wherein the use of a single collective screen strengthens cooperative learning and the role of the More Knowledgeable Other (MKO) among learners without being fractured by digital distractions (Arsyad, 2014).

This sociocultural transformation is likewise supported by the teacher's role as the primary MKO agent who actively develops competence through Subject Teacher Association (MGMP) forums, workshops, and the preparation of Lesson Plans (RPP)

based on manual contingency plans (backup plans) to guarantee the continuity of scaffolding provision amidst potential technical constraints (Mulyasa, 2019). Nevertheless, the optimal and equitable achievement of the ZPD remains hindered by physical facility limitations, such as the disproportionate projector ratio (two units for three classes) and Wi-Fi connection fluctuations in regular classrooms. From Vygotsky's perspective, a deficit in cultural tools can hinder the flow of students' knowledge internalization; therefore, digital infrastructure equity and adequate facility support constitute an absolute prerequisite for ensuring that the full potential of multimedia learning can be equitably experienced by all students (Barnawi, 2015).

Analysis of Research Findings Based on Kurt Lewin's Theory

The implementation of technology integration in Islamic Religious Education (IRE) instruction at MA Al-Muchtari is analyzed using Kurt Lewin's Force Field Analysis framework, which demonstrates a balance between driving forces in the form of the effectiveness of interactive media (Canva, YouTube, Quizizz) in visualizing abstract materials such as Tauhid and Muamalah and teacher commitment through MGMP and restraining forces in the form of physical infrastructure limitations (Husaini, 2013). At the unfreezing stage, traditional verbalistic teaching practices are deconstructed through a visual-interactive approach. Interestingly, pesantren regulations prohibiting personal mobile devices actually support this process by diverting student focus to a shared screen via a projector or Smart TV, thereby creating a learning condition free from digital distractions and collectively directed (Arsyad, 2014).

The transition stage (change/moving) is manifested through the consistent application of digital media alongside the psychological-operational resilience of teachers who are agile in addressing technical constraints through the formulation of Lesson Plans (RPP) based on manual contingency plans (backup plans) (Mulyasa, 2019). Although technology-based learning has reached the pedagogical refreezing stage and become an effective new norm, systemic institutionalization still faces vulnerabilities due to the limited projector ratio and Wi-Fi network fluctuations in regular classrooms. Therefore, strengthening equitable and sustainable infrastructure support is an absolute prerequisite to prevent the stability of educational change innovation from regressing back to old patterns (Barnawi, 2015).

4. CONCLUSION

The integration of technology in Islamic Religious Education (IRE) instruction at MA Al-Muchtari, Bogor Regency, has been systematically implemented based on the dimensions of organizational effectiveness. In terms of goal clarity, madrasah leaders demonstrate a strong commitment alongside teachers through the formulation of the Operational Curriculum of the Madrasah (KOSP) and collaborative instructional modules to utilize digital media such as YouTube, Canva, Quizizz, and artificial intelligence to visualize abstract materials such as Monotheism (Tauhid), Islamic Jurisprudence of Social Transactions (Fiqh Muamalah), and the History of Islamic Culture with a clear initial orientation. Regarding strategy clarity, technology is positioned as a primary supporting pillar within the Lesson Plan (RPP) that combines hardware and interactive software to transform one-way lecture methods into participatory learning that boosts students' cognitive retention and learning independence. Furthermore, the policy formulation process successfully overcomes facility limitations through the optimization of the Computer Laboratory as a learning resource center, as well as strict adherence to pesantren regulations prohibiting personal mobile devices through a shared screen strategy, thereby successfully eliminating digital distractions effectively, supported by the cultivation of etiquette (adab) and periodic teacher training.

Program planning in this madrasah is supported by operational budget allocations for equipment maintenance, CCTV security, and the formulation of manual contingency plans (in the form of whiteboards or HOTS Student Worksheets) by IRE teachers to anticipate sudden technical constraints. Educator competence enhancement is also formulated sustainably through Subject Teacher Association (MGMP) forums, internal workshops, and independent learning, accompanied by routine academic supervision by the madrasah principal. Although resource availability faces quantitative constraints in the form of a limited projector ratio (two units for three regular classes) and Wi-Fi signal fluctuations in regular classrooms, the available technological devices are in good condition and user-friendly. Overall, the utilization of this interactive media has proven successful in creating a pleasant learning environment, eliminating boredom, and optimally boosting students' focus, participation, and interest in IRE subjects.

5. REFERENCES

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