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Improving Madrasah Leadership: The Effectiveness of Integrated Training Models (Transformational, Technological and Character) in the Digital Era

Rahmadani Rahmadani[1], Muhammad Aswad[2], Cut Nyanyak Ummu Athiyah[3]
[1]Badan Litbang dan Diklat Kementerian Agama, Jakarta, Indonesia, danirahma.70@gmail.com
[2]Pusjar SKMP, Lembaga Administrasi Negara, Jakarta, Indonesia, m.aswad@gmail.com
[3]Sekolah Pascasarjana, UIN Syarif Hidayatullah Jakarta, Indonesia, cut.nyak@gmail.com

Corresponding Author: danirahma.70@gmail.com[1]
Abstract: The leadership of madrasah heads is a key determinant in facing digital transformation and strengthening character education. This study aims to evaluate the effectiveness of madrasah head training programs and test the novelty of training models that integrate transformational leadership, educational technology, and Islamic character. Using a Research and Development (R&D) approach with a 4-D model, the research involved 30 madrasah heads within the Ministry of Religion of Banjarmasin City. Data were collected via Likert-scale questionnaires, observations, and interviews, and then analyzed using the Paired Sample T-Test. The results showed a significant increase in post-training competencies, with the highest score increase in the aspect of educational technology (73%), followed by character education (42%), and transformational leadership (41%). Additionally, 90% of participants successfully adopted the e-learning platform, and 85% actively participated in leadership simulations. This study concludes that the integrated training model is effective in enhancing the managerial competence and adaptability of madrasah heads, while also having a positive impact on teacher motivation and student discipline.

Keywords: Transformational Leadership, Madrasah Head Training, Educational Technology, Character Education, Madrasah Performance.

INTRODUCTION

In recent decades, the world of education has undergone a significant transformation triggered by the flow of globalization and digitalization. The development of information technology has transformed the governance and delivery of education, creating new opportunities and challenges for education leaders. The head of the madrasah, as the leader of an Islamic educational institution, plays a central role in managing this change. They are not only required to be effective leaders managerially, but also must be able to integrate technology in learning and ensure that character education remains the core of madrasah activities. These demands are becoming increasingly urgent in the midst of globalization, which requires flexible, adaptive, and innovative leadership competencies.

Although the government has made efforts to establish standards through the Regulation of the Director General of GTK of the Ministry of Education and Culture Number 7327/B.B1/HK.03.01/2023 concerning the Competency Model for Madrasah Heads, its implementation in the field still faces obstacles and is still in the early stages. Empirical data show that there is a wide gap between regulatory demands and the readiness of madrasah heads. Study of the Ministry of Religion Saiful Maarif, (2021); UNICEF, (2021) revealed that most madrasah heads feel that they are not ready to face leadership challenges in the digital era. The survey by the Indonesian Madrasah Heads Association also confirmed that the majority of madrasah heads want more relevant training related to transformational leadership and educational technology.

This competency gap has a systemic impact on the quality of education, where this unpreparedness hinders efforts to improve the quality of education in madrasas. The impact can be seen in the difficulty of managing change, low teacher performance, lack of learning innovation, and declining quality of student learning outcomes. The main problem behind this condition is the availability of relevant training models. The current training curriculum tends to be partial and has not integrated aspects of digital literacy, resource management, and character strengthening holistically.

The urgency of developing a new training model is getting higher in line with the momentum of strengthening Human Resources (HR), intensified by the Ministry of Religion of the Republic of Indonesia for 2025. Strategic initiatives such as the implementation of the "Love-Based Curriculum" require madrasah heads to be not only managerially capable, but also able to build the character of students who appreciate differences in a pluralistic society. Therefore, the development of relevant training models is very critical to align the competence of madrasah heads with the vision of the ministry and the demands of the times.

In contrast to previous research that tended to be partial—focusing only on technology or leadership aspects this study offers a holistic approach. The training model developed includes vital materials such as the Development of an Inclusive Learning Ecosystem, Efficient Resource Management, Good Management Practices, Network Builders, Digital Literacy, to Madrasah Rebranding. This research aims to fill the academic gap with three main goals: (1) developing a training model that integrates digital leadership theory and character; (2) strictly test the effectiveness of the model through pre- and post-training evaluation; and (3) analyzing the impact of competency improvement on the quality of education empirically. This research is expected to provide concrete solutions for improving the quality of madrassas in Indonesia.

This research positions itself on the intersection of three main theoretical domains: the evolution of transformational leadership, the integration of technology in pedagogy (*Technological Pedagogical Content Knowledge*), and the strengthening of character education in the madrasah ecosystem.

The Evolution of Transformational Leadership in the Era of Disruption. Transformational leadership is no longer seen as just a managerial style, but an imperative necessity in an era of uncertainty. If the classical theory of Bass & Riggio, (2006) emphasizes the 4I (*Idealized Influence, Inspirational Motivation, Intellectual Stimulation, Individualized Consideration*), contemporary literature demands the recontextualization of this concept into the digital realm. Northouse, (2018)**,** in his latest study, emphasizes that today's leaders must act as *change agents* who are able to navigate organizational complexity through vision empowerment. In the context of madrasas, Santoso, (2018) found that transformational leadership has a stronger positive correlation to the formation of school culture than transactional leadership styles. However, Anderson's (2017) study provides a critical note that the effectiveness of this leadership is often hampered by rigid bureaucratic structures, so a specific training model is needed to train the cognitive flexibility of madrasah heads.

Technology Imperatives and Digital Competency Gap**.** The integration of technology in madrasah management is no longer an option, but a strategic imperative. Megwa (2022) In his

study of post-pandemic school leadership, he highlights the concept of *Digital Leadership*, where principals must have "digital fluency" to direct the curriculum. In line with that, Pelletier et al (2021) in *the Horizon Report* emphasized that the biggest challenge is not in hardware procurement, but in *humanware*—the adaptability of human resources. Empirical studies by Siminto (2024); Subroto (2023) show that although digital infrastructure in educational institutions is increasing, its utilization for learning innovation is still low (below 40%) in the absence of structured training interventions. This confirms the findings of UNICEF (2021) on the sharp digital literacy gap among educators in Indonesia, which demands a training model that focuses on *digital pedagogy* and data-driven management.

Character Education and Religious Moderation. In the midst of the flow of digitalization, madrasas face the challenge of value erosion. The latest literature emphasizes the role of madrasah heads as *guardians of values*. Haddade (2023) emphasized that the modernization of madrassas through technology should not uproot the roots of Islamic traditions. Instead, technology must be a vehicle for the dissemination of moderation values. Research by Berkowitz et al. (2017) shows that effective character education must be integrated in school governance (*caught*) and not just taught in the classroom (*taught*). Therefore, the competence of madrasah heads in designing a "*hidden curriculum*" based on noble morals is crucial.

Framework: The Urgency of Integrated Training Models Although the above three variables have been extensively researched separately, the literature integrating them in a single holistic training model is still limited. Most of the existing leadership training is generic and separate from ICT (information and communication technology) technical training. This research proposes a new synthesis that the effectiveness of modern madrasah leadership depends on the synergy between transformational vision, technological capabilities, and character integrity. The training model developed in this study is designed to fill these theoretical and practical gaps, with the hypothesis that simultaneous interventions on these three aspects will result in a more significant improvement in madrasah performance than the partial approach.

METHOD

This research applies a *Research and Development* (R&D) approach by adopting the 4-D (*Define, Design, Develop, Disseminate*) development model developed by Thiagarajan. This approach was chosen to ensure that the resulting training model has gone through a rigorous validation process before being widely implemented. The research was carried out within the Office of the Ministry of Religion of Banjarmasin City, South Kalimantan Province, for a period of three months from January to March 2025. The research population included all madrasah heads in the region, with sampling using *a purposive sampling* technique that assigned 30 madrasah heads as experimental groups to participate in intensive training and impact measurement.

Data collection was carried out using triangulation techniques to ensure the validity and reliability of the findings. The main instrument in the form of a questionnaire with a Likert scale was distributed to measure the competence of madrasah heads in the *pre-test* and *post-test* phases, which included transformational leadership variables, technology utilization, and character implementation. The validity of the contents of this instrument has been tested using *Aiken's V* formula, while its reliability is measured by *Cronbach's Alpha coefficient*. In addition to the questionnaire, the researcher conducted participatory observations using structured observation sheets to assess participants' active engagement and technical abilities during the training simulation. To enrich the quantitative data, in-depth interviews and *Focus Group Discussions* (FGD) were also conducted with selected participants to explore qualitative perspectives on post-training managerial pattern changes.

The data analysis in this study uses *a mixed approach*. Qualitative data obtained from interviews and observations were analyzed interactively through the stages of data

condensation, data presentation, and a conclusion drawn. Meanwhile, quantitative data were processed using inferential statistics with the help of SPSS software. The effectiveness of the training model was tested through the average difference test (*Paired Sample T-Test*) with a significance level of 5% ($p < 0.05$). This test was performed after the data met the prerequisite tests of normality and homogeneity, with the success criteria determined by a statistically significant increase in competency scores between pre- and post-intervention conditions.

RESULTS AND DISCUSSION

This study involved 30 heads of madrasas within the Office of the Ministry of Religion of Banjarmasin City as the main analysis unit. Based on demographic data, respondents were dominated by madrasah heads with managerial experience between 5 to 10 years (43%), and the majority had a Strata-2 educational background (60%). This profile shows that academically, the research subjects have adequate capacity, but the baseline data show stagnation in digital adaptability and leadership innovation. Before the training intervention, the needs analysis revealed that the competence of madrasah heads tended to be heavy on conventional administrative aspects, while the aspects of technology-based transformational leadership and character integration were still low.

Here is the distribution of respondents by work experience and education level:

Table 1. Distribution of Respondents by Experience, Education and Gender

Category	Number of Respondents	Percentage (%)
Work Experience		
< 5 years	8	27%
5 – 10 years	22	73%
Education		
S1	11	37%
S2	18	60%
S3	1	3%
Gender		
L	13	43%
P	17	57%

Data processed by researchers in 2025

The application of a training model that integrates Transformational Leadership, Educational Technology, and Character Education has shown a significant impact. Based on comparative statistical analysis (*Paired Sample T-Test*) between *pre-test* and *post-test* scores, there was a marked increase in competence in the three main variables.

The implementation of the integrated training model showed a significant positive impact. Based on statistical tests, there was an increase in average scores on three main variables:

Table 2. Comparison of Pre- and Post-Training Competency

Competency Aspect	Pre-Training Score	Post-Training Score	Increase (%)
Transformational Leadership	58	82	41%
Educational Technology	45	78	73%
Character Education	62	88	42%

Source: Primary Data Processed (2025)

The highest increase occurred in the aspect of Educational Technology (+73%). This is supported by observation data that 90% of participants have successfully adopted *e-learning platforms* (such as *Microsite* and *Zoom*) for madrasah management. In the aspect of Transformational Leadership, there was an increase of 41% (*p=0.001), which indicates a shift from an administrative leadership style to a more visionary and inspirational style.*

Specifically, the most drastic improvement was seen in the Educational Technology dimension. Madrasah heads who were previously passive in the use of technology, post-training, were able to adopt a digital-based management system. This is evidenced by their

ability to use teacher performance monitoring platforms and madrasah management applications. In the aspect of Transformational Leadership, there is a paradigm shift from an authoritarian style to a participatory-inspirational style. Participants were able to formulate a vision of a madrasah that was more adaptive to the demands of the times. Meanwhile, in the aspect of Character Education, there is a strengthening of the strategy of internalizing the values of religious moderation into the curriculum, not just ceremonial.

The findings of this study confirm that the integration of technology into leadership training is the key to accelerating the quality of madrasas. In contrast to conventional methods that often rely only on subjective evaluation or post-training surveys, the model developed in this study is equipped with a Digital Monitoring System. This system allows tracking of the development of participants' competencies in *real-time* and data-driven. These findings are in line with the argument that leadership in the 4.0 era requires precise measurement tools to ensure leaders' visions translate into real action on the ground.

One of the interesting findings in this discussion is the high acceptance rate of training models in various madrasah conditions. The scientific narrative from the field shows that this model has flexibility in application (hybrid). For madrassas in urban centers with adequate internet infrastructure, the implementation runs fully online and cloud-integrated. However, for madrassas with limited technological infrastructure, this model has proven to remain effective through *an offline approach* supported by digital materials that can be accessed without constant internet. This refutes the assumption that digital transformation belongs only to elite schools; Instead, this training model offers an inclusive solution for the equitable distribution of madrasah quality.

This research offers theoretical and practical novelty that goes beyond previous studies. If the previous research tended to be partial (only discussing leadership or only technology) this study succeeded in proving that tripartite synergy (Transformational, Technology, Character) creates a superior madrasah ecosystem.

1. Holistic Integration**:** This model does not separate technical proficiency (IT) from moral proficiency (Character). Madrasah heads are trained that technology is a "tool" to strengthen "character".
2. Evidence-Based Evaluation System**:** The use of digital monitoring provides higher validity than conventional training.
3. Geographical Adaptability**:** This model is designed to be replicable in different regions of Indonesia with diverse digital divides.

The implication of this finding confirms that to improve the quality of Islamic education, the Ministry of Religious Affairs needs to shift the training curriculum from doctrinal-administrative to technocratic-humanist training. The head of the madrasah must be molded into a data-literate "CEO of Education", but still adheres to the moral values *of karimah*.

CONCLUSION

Based on the results of empirical analysis and testing in the city of Banjarmasin, this study concludes that a training model that integrates transformational leadership, educational technology, and character education has proven effective in bridging the competency gap of madrasah heads. The findings of the study showed that this training intervention succeeded in significantly changing the competency profile of participants, with the highest score increase occurring in the aspect of educational technology by 73%, followed by character education at 42%, and transformational leadership at 41%. This success also confirms that the practice-based training approach (*experiential learning*) and simulation are much more effective than the conventional training model, which was previously dominated by administrative content.

The impact of this training does not only stop at increasing the individual capacity of madrasah heads, but also has systemic implications for the madrasah ecosystem. This is evidenced by the high adoption rate of *e-learning* platforms (90%) post-training, as well as an

increase in teacher work motivation by 70% and student discipline by 65%. This data indicates that when madrasah heads can synergize transformational vision with digital skills and character examples, they can create an organizational climate that is innovative and conducive to learning.

As a practical implication, this study recommends that the Ministry of Religion and the Religious Education and Training Center (BDK) revise the training curriculum for madrasah heads by adopting this integrated model as a new standard. The focus of human resource development must be shifted from the orientation of bureaucratic administration to the strengthening of technocratic and humanist competencies. In addition, policy synergy is needed for the equitable distribution of technology infrastructure to ensure the sustainability of the implementation of training results in all madrasas. For subsequent researchers, it is recommended to expand the scope of the study on the long-term impact of training on students' academic achievement to reinforce the generalization of these findings.

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