

Efforts to Improve the Quran Reading Ability of Hearing-Impaired Students Thru Collaboration of Quantum Learning and Multisensory Approach

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ABSTRACT

Deaf students face significant challenges in learning to recite the Quran due to auditory limitations. This study evaluates the effectiveness of a collaborative model that combines the Quantum Learning method with a multisensory approach to improve Quranic literacy. Using a Classroom Action Research (CAR) design across three cycles, we observed five sixth-grade students at SLB Dharma Bhakti Dharma Pertiwi. Data were collected through observation, interviews, and documentation throughout the intervention period. Results demonstrate a substantial improvement in reading proficiency, rising from a 30% success rate (average score 6.1) to 90% (average score 8.0) by the final cycle. This model fosters active, inclusive learning, significantly boosting student confidence. These findings suggest that integrating multisensory strategies effectively enhances adaptive education for students with hearing impairments

INTRODUCTION

Education plays a crucial role in transmitting values and developing student competence, particularly for learners with special needs. Within the framework of inclusive education, pedagogical adaptation is essential to address the diverse characteristics of contemporary learners (Nadhiroh & Ahmadi, 2024; Muliyadi et al., 2025). A significant challenge in this context is facilitating Quranic literacy for deaf students, whose auditory limitations fundamentally impact their linguistic and cognitive development. Current traditional instructional methods used in special education settings often rely heavily on verbal transmission, which has proven increasingly ineffective in meeting these students' unique learning needs (Rahayu, 2023; Jundi et al., 2023).

Empirical evidence suggests that traditional methods in special schools (SLB) often lead to low student engagement and difficulty mastering Hijaiyyah letters and Tajweed rules (Syukur et al., 2025). While visual media has been identified as a critical supporting tool (Sukanti, 2022), there is an urgent need for a more systemic integration of pedagogical strategies. This study proposes a synergy between *Quantum Learning* utilizing the SAVI (Somatic, Auditory, Visual, and Intellectual) and TANDUR (Grow, Experience, Name, Demonstrate, Repeat, and Celebrate) frameworks and a multisensory approach that simultaneously optimizes visual, kinesthetic, and tactile modalities.

Theoretically, this model is grounded in constructivism, which encourages active knowledge construction, and the theory of *multiple intelligences*, which supports diverse learning styles (Arifin, 2017). By moving beyond the repetitive patterns of behaviorism, this innovative approach fosters a contextual and enjoyable learning environment specifically tailored to overcome the communication barriers faced by deaf students (Hanafi et al., 2019; Wahab et al., 2022).

Given these identified gaps, this study aims to evaluate the effectiveness of the collaboration between *Quantum Learning* and the multisensory approach in improving the Quranic reading ability of sixth-grade deaf students at SLB Dharma Bhakti Dharma Pertiwi. This research contributes to the development of adaptive and inclusive pedagogical models for Islamic religious education. The remainder of this article presents the methodology of the Classroom Action Research, an analysis of the empirical findings, and a discussion on the implications of this model for future inclusive education practices.

LITERATURE REVIEW

This research employs the Classroom Action Research (CAR) design as a methodological framework for the systematic improvement of instructional practices. Unlike traditional quantitative studies, CAR positions the researcher as an active participant engaged in continuous cycles of reflection to address classroom-specific challenges (Syahrizal & Jailani, 2023). The research procedure, conducted through three cycles of planning, action, observation, and reflection, allows for dynamic pedagogical adaptation. Data validity is ensured through triangulation, where qualitative insights from observations and interviews are cross-referenced with quantitative test results to provide a comprehensive and objective assessment (Sinaga, 2023; Rohmanurmeta, 2017).

Theoretically, the intervention used in this study involves integrating the Quantum Learning method with a multisensory approach. Quantum Learning, through its SAVI (Somatic, Auditory, Visual, and Intellectual) framework and TANDUR (Grow, Experience, Name, Demonstrate, Repeat, and Celebrate) strategy, offers a structured approach to creating an interactive and meaningful learning atmosphere. For deaf students, the efficacy of this method is enhanced by multisensory strategies that leverage visual, kinesthetic, and tactile stimuli as compensation for auditory channel limitations (Wahab et al., 2022). The integration of these elements is expected to boost student engagement, measured by participation frequency ($P = \frac{f}{N} \times 100\%$) and reading competence based on standardized grading criteria.

Furthermore, constructivism serves as the primary theoretical foundation for this model. Constructivism posits that knowledge is built through direct experience, which, in this context, translates into students' interaction with responsive learning media (Arifin, 2017). By blending diverse sensory stimuli with the supportive structure of Quantum Learning, deaf students are encouraged to move beyond rote memorization and build a functional understanding of Hijaiyyah letters and Tajweed rules. Consequently, this model conceptually bridges the gap between Islamic religious education curricula and the specific needs of deaf learners, transforming the classroom from a passive instructional environment into an inclusive space for active exploration (Millah et al., 2024; Prasetyo, 2024).

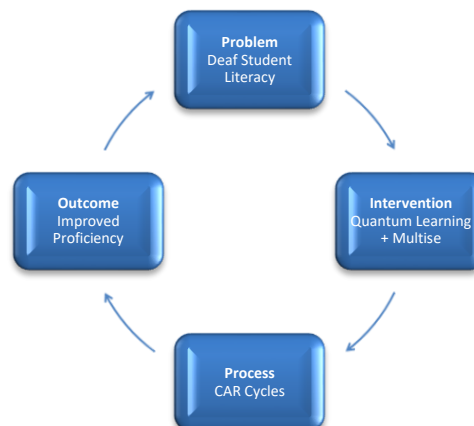


Figure 1. Conceptual Framework of the Research.

METHODOLOGY

This research employs Classroom Action Research (CAR) as a systematic framework to enhance instructional quality through iterative cycles of reflection. The research design is structured into three continuous cycles, each comprising four essential stages: planning, action, observation, and reflection. This spiral model allows for dynamic pedagogical adjustments, ensuring that teaching strategies are refined based on empirical findings at each stage to better address the specific learning obstacles students face (Syahrizal & Jailani, 2023).

The population of this study comprises the students of SLB Dharma Bhakti Dharma Pertiwi, with a purposively selected sample of five sixth-grade deaf students, four males and one female. This sample size is deliberately chosen to enable an intensive, individualized approach to facilitating Quranic literacy, which is crucial given the participants' unique auditory and cognitive needs. The pedagogical intervention focuses on the collaborative application of Quantum Learning and multisensory methods, specifically designed to optimize students' engagement in learning.

Data analysis is conducted using a qualitative descriptive approach supported by triangulation techniques to ensure validity and objectivity. This process involves cross-referencing data from direct observations of the learning process, semi-structured interviews, classroom documentation, and academic performance tests (Sinaga, 2023). Student participation rates are calculated using the formula $P = \frac{f}{N} \times 100\%$, where f represents the frequency of engagement and N denotes the total number of subjects. Academic performance is assessed based on the following classification: 0–39.9 (Very Poor), 40.0–54.9 (Poor), 55.0–69.9 (Fair), 70.0–84.5 (Good), and 85.0–100 (Excellent). The analytical process, comprising data reduction, data display, and verification, serves as the foundation for evaluating the intervention's effectiveness and guiding subsequent research cycles (Rohmanurmeta, 2017; Millah et al., 2024).

RESEARCH RESULT

1. Implementation Process of Sign-Language-Based Quranic Learning

The implementation of the sign-language-based Quranic instruction at SLB Dharma Bhakti Dharma Pertiwi followed a five-stage pedagogical framework designed to accommodate the students' auditory limitations:

- a. **Baseline Assessment:** Mapping the students' proficiency in recognizing Hijaiyyah letters and manual signing.
- b. **Media Development:** Designing visual aids (flashcards, posters, and signed mushaf) based on the principles of total communication (Qothrunnada, 2023).
- c. **Modeling and Scaffolding:** The instructor demonstrated standardized hand gestures, followed by scaffolded repetition to ensure mastery from letters to complex words (Nurdyansyah, 2023).
- d. **Formative Evaluation:** Observations and reading assessments were conducted to monitor movement precision and verse comprehension (Musfirah, 2025).

- e. **Parental Engagement:** Collaborative efforts were made to ensure consistent reinforcement of sign language practice in the home environment (Rahma, 2024).

During the instruction, the teacher utilized a dual-methodological approach. The primary method involved verbal communication and lip-reading, while the secondary method employed manual signing to clarify complex concepts when students had difficulty decoding verbal discourse.

Action Research Findings (Sixth-Grade Cohort)

This research was conducted as a collaborative action project involving five sixth-grade students (four males, one female) during the first semester of the 2025/2026 academic year. The study was structured into three cycles, with three distinct sessions per cycle.

The findings indicate that while the students exhibited cognitive letter recognition similar to that of their hearing peers, their primary barrier was vocal articulation. The integration of visual materials and manual signing significantly enhanced the learning experience. The teacher's approach, which contextualized articulatory differences through manual gestures, improved the students' ability to grasp Hijaiyyah and Tajweed rules. The following figure illustrates the integration of Hijaiyyah signs within the classroom:

Bahasa Isyarat Malaysia - Isyarat Islam (Edisi 2)



Picture 1. Hijaiyyah letters and the use of gestures in learning the Qur'an

Discussion: Pedagogical Efficacy and Challenges

The success of this intervention is consistent with prior studies indicating that multisensory and sign language approaches significantly enhance Quranic literacy among deaf students (Hadhy Saputra, 2024; Ningrum, 2024). Nurdyansyah (2023) observed an increase in mean reading scores from 52.45 to 79.85, supporting the efficacy of standardized sign language media.

However, several challenges emerged. The primary obstacle was the limited availability of educators proficient in Quranic sign language and the absence of a national standardized manual for specific Quranic verses (Mahdi, 2021). Furthermore, student motivation remained sensitive to the levels of

support in their respective home environments. This underscores the need for a more robust national standardization of Quranic sign language to ensure consistency across inclusive educational institutions.

2. Learning Outcomes: The Integration of Quantum Learning and Multisensory Approaches

The instructional intervention at SLB Dharma Bhakti Dharma Pertiwi employed a collaborative Quantum Learning model and multisensory approaches. This pedagogical framework employed the SAVI (Somatic, Auditory, Visual, Intellectual) method, which provided a comprehensive strategy for addressing the unique cognitive and sensory profiles of deaf students. By fostering a positive learning environment and using adaptive media such as Hijaiyyah flashcards, color-coded posters, and digital kinesthetic tools, the instructor successfully scaffolded students' mastery of Quranic structures, including Makhraj and Tajweed.

Performance Analysis

The effectiveness of this model is evidenced by the progressive improvement in student performance throughout the three action research cycles. Table 1 summarizes the students' academic progression from the pre-intervention phase through the final cycle.

Table 1. Student Academic Performance Across Research Cycles

No	Student Name	Pre-Action	Cycle I	Cycle II	Cycle III
1	Ahmad Syaputra	68	75	80	90
2	Hanif Kurniawan	65	70	78	90
3	Laili Syakira	60	65	75	85
4	Heru Pratama	56	60	65	70
5	Yusuf Hidayat	57	60	65	75
Mean		61.2	66.0	72.6	82.0

Note: Scores have been normalized to a 100-point scale for clarity and consistency.

The data indicates a significant upward trend in student achievement. The mean score increased from 61.2 in the pre-intervention phase to 82.0 by the end of Cycle III. This progression validates the efficacy of the Quantum Learning and multisensory collaboration. The model created a highly participative and supportive environment that empowered students to overcome their learning barriers (Wahyudi & Hariyanto, 2017a).

Discussion of Findings

The results demonstrate that Quantum Learning's emphasis on meaningful, contextual experience, combined with multisensory input, significantly optimized students' absorption of Quranic material. As highlighted by Alma'zumi (2023), this dual approach successfully translates abstract linguistic structures into tangible concepts. Furthermore, the outcomes align with findings by Wahyudi & Hariyanto (2017b), confirming that Quantum Learning effectively enhances Quranic literacy scores among students with special needs.

Beyond academic gains, the intervention served a therapeutic purpose by fostering self-confidence and learning autonomy. This supports the paradigm of "education as therapy" (Arifin, 2017), in which the pedagogical process simultaneously addresses students' cognitive, affective, and psychomotor needs. The successful integration of these methods suggests that a multisensory-Quantum framework is a highly viable model for inclusive religious education, ensuring that students not only achieve technical proficiency but also internalize the cultural and spiritual values inherent in Quranic education (Palupi, 2020).

3. Effectiveness of the Quantum Learning and Multisensory Collaborative Model

The effectiveness of the collaborative model integrating Quantum Learning with multisensory approaches was evaluated through three action research cycles. The analysis focused on the dynamic shifts in student engagement and academic performance, utilizing the TANDUR framework (Tumbuhkan/Grow, Alami/Experience, Namai/Name, Demonstrasikan/Demonstrate, Ulangi/Repeat, Rayakan/Celebrate).

The Evolution of Student Engagement

Observational data from pre-intervention to Cycle III indicate a progressive transition from passive to active learning. As shown in Table 2, the percentage of active student participation increased significantly throughout the study.

Table 2. Summary of Student Participation Across Cycles

Phase	Total Observations	Active Participation (%)	Status
Pre-Action	12/40	30%	Low
Cycle I	20/40	50%	Moderate
Cycle II	26/40	65%	High
Cycle III	36/40	90%	Excellent

Note: Participation indicators included sportiveness, task completion, opinion sharing, and note-taking.

The implementation of the SAVI (Somatic, Auditory, Visual, Intellectual) method proved instrumental in compensating for the students' auditory limitations. By shifting the learning modality toward visual-tactile inputs such as Hijaiyyah sign language, kinetic gestures, and sensory-rich media, the students' self-confidence and learning autonomy grew substantially.

Pedagogical Reflection and Sustainability

The transition from Cycle I to Cycle III revealed a learning curve in which the instructor's ability to adapt to students' sensory needs became the primary catalyst for success. While initial cycles faced challenges regarding student focus and standardized articulation, the final cycle achieved a 90% engagement rate, confirming the model's efficacy.

Strategic Recommendations for Sustainability:

- a. **Consistent Implementation:** The Quantum Learning Multisensory model should be adopted as a core pedagogical strategy in religious education for the deaf.
- b. **Continuous Professional Development:** Teachers require ongoing training to refine sign-language-based Quranic instruction.
- c. **Adaptive Resource Development:** Ongoing investment in multisensory teaching aids is necessary to accommodate individual sensory profiles.
- d. **Home-School Synergy:** Parental involvement remains critical to maintaining the motivational gains achieved during classroom instruction.

DISCUSSION

The findings indicate that the collaborative Quantum Learning model and multisensory approaches serve as catalysts for cognitive and affective development in deaf students. The steady improvement observed across the three cycles suggests that the students' academic progress was not merely the result of repetitive drilling but rather a consequence of a shift toward a more inclusive, sensory-rich learning environment. By employing the SAVI (Somatic, Auditory, Visual, Intellectual) framework, the instructional process effectively compensated for auditory limitations, allowing students to internalize Quranic structures through alternative sensory pathways.

The progression in student engagement from passive observation to highly interactive participation supports the theory that learning environments designed to reduce anxiety and promote self-expression are essential for learners with special needs. This reflects the "education as therapy" paradigm, where the act of learning is intrinsically linked to building self-confidence and personal identity. The success of the final cycle, characterized by near-total engagement, suggests that once the multisensory bridge is established, students can manage complex religious literacy tasks previously deemed inaccessible.

Furthermore, these results underscore the limitations of traditional, verbal-heavy instructional models in special education. The data suggests that when religious education is adapted through visual-kinesthetic modalities, students do not merely "memorize"; they "construct" their understanding of the Quranic text. This aligns with the scholarly discourse on the need for standardized sign language frameworks in Islamic education. The significant qualitative shift in student behavior, evidenced by their increased willingness to participate, share opinions, and take responsibility for their learning, confirms that the model successfully addresses the affective barriers inherent in traditional special education settings.

Ultimately, the effectiveness of this pedagogical model lies in its ability to reconcile the formal requirements of Quranic education with students' individual needs. By prioritizing TANDUR (Tumbuhkan, Alami, Namai, Demonstrasikan, Ulangi, Rayakan) principles, the study provides a viable alternative to didactic instruction, offering a roadmap for religious educators to cultivate literacy that is both academically rigorous and spiritually meaningful.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings, the following recommendations are proposed to ensure the sustainability and scalability of the instructional model:

- **For Educators:** Teachers should consistently adopt the multisensory-Quantum collaborative model, prioritizing visual and kinesthetic stimuli. It is essential to develop adaptive media, such as standardized Hijaiyyah sign language posters and digital kinesthetic resources, to tailor instruction to individual student profiles.
- **For Educational Institutions:** Schools are encouraged to institutionalize this pedagogical model by providing continuous professional development programs. Equipping teachers with the technical skills to implement sign-language-based Quranic instruction is vital to maintaining instructional consistency.
- **For Home-School Synergy:** Given the significant role of the home environment, institutions should foster collaborative relationships with parents. Regular briefings and training for guardians can ensure that learning reinforcement continues beyond the classroom, which is critical for long-term retention.
- **For Policy and Future Research:** Future studies should explore the long-term longitudinal impact of this model on Quranic memorization (*tahfidz*). Additionally, there is an urgent need for national-level standardization of Quranic sign language to ensure that these pedagogical innovations can be implemented uniformly across all inclusive Islamic educational institutions.

ADVANCED RESEARCH

This study has certain limitations. First, the small sample size and single-site setting limit the generalizability of the findings. Future research should involve larger, multi-site studies to validate the model's effectiveness across diverse contexts. Second, as this was a three-cycle study, the long-term retention of Quranic literacy and its deeper theological impact remain to be explored through longitudinal research.

Furthermore, the lack of a standardized national Quranic sign language necessitated teacher-led adaptations. Consequently, future studies are encouraged to focus on developing and empirically testing a standardized Quranic sign language curriculum. Finally, while this research focused on teacher-led interventions, future work should integrate assistive technologies, such as mobile apps and augmented reality, to better support students' autonomous learning and independent religious literacy.

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