Enhancing Critical Thinking Skills Among Islamic High School Student Leaders Through Interactive Training Programs: A Case Study

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Abstract: Modern students need critical thinking to solve complex situations. This study examines interactive critical thinking training for SMAIT Darul Quran student leaders. Postgraduate students evaluated Pamulang University's community service program using pre- and post-test evaluations and qualitative observations. New student council members received three days of training. The programs helped students solve problems and make decisions with theoretical presentations, group discussions, simulations, and games. The critical thinking paradigm was unusual because it included Islamic ideals like honesty, responsibility, and empathy. The study found that critical thinking scores increased from 65 to 85. Students learned reasoning, analysis, and problem-solving. Qualitative feedback reinforced interactive and contextual training for student involvement and skill application. Islamic teaching aligned with students' cultural and spiritual framework, making it more relevant and accepted. 92% of students participated enthusiastically and collaboratively in group discussions and simulations. 95% said the leadership program was helpful. Teachers and facilitators said the curriculum improved participants' decision-making and conflict resolution. This study advances educational leadership critical thinking research. Student leaders gain critical thinking through interactive learning, digital tools, and value-based education. Research might study how such training influences student leadership and school culture.

1. Introduction

In the 21st century, critical thinking has emerged as an indispensable skill for students, equipping them to navigate the complexities of modern life. With rapid technological advancements, the proliferation of information, and the increasing interconnectedness of global societies, students must think critically to analyze situations, solve problems, and make informed decisions [20]. This skill becomes particularly significant for student leaders, who are often at the forefront of managing their peers and implementing initiatives within their schools. Leadership in this context is no longer confined to traditional hierarchical models but instead demands an ability to engage in analytical thinking, collaborative problem-solving, and ethical decision-making [21]. These attributes are especially critical in educational institutions that emphasize holistic development, such as SMAIT Darul Quran, an Islamic high school in Indonesia. SMAIT Darul Quran stands out for its unique approach to

integrating Quranic values with modern education. The school's emphasis on character development, technological integration, and academic excellence provides an ideal environment for fostering critical thinking among its students. As a school rooted in Islamic values, it prepares students to lead with integrity, balancing spiritual principles with practical problem-solving skills [22]. However, despite these strengths, challenges remain in cultivating critical thinking among student leaders. Newly elected student council (OSIS) members often lack the analytical and evaluative skills necessary for effective leadership [23]. This gap underscores the need for targeted interventions that enhance critical thinking and align with the student's cultural and spiritual context [24].

Recognizing this need, postgraduate students from Universitas Pamulang conducted a community service program titled "Enhancing Critical Thinking Skills Among Islamic High School Student Leaders Through Interactive Training Programs." This initiative addressed   OSIS members' challenges at SMAIT Darul Quran by implementing an innovative and interactive training program [25]. The program's design was grounded in contemporary educational theories, incorporating experiential learning, problem-based learning (PBL), and technology integration [26]. Furthermore, it emphasized incorporating Islamic values into the critical thinking framework, ensuring relevance and resonance with the student's beliefs and institutional culture.

1.1. The Importance of Critical Thinking in Leadership

Critical thinking is widely recognized as a cornerstone of effective leadership. Leaders with critical thinking skills are better equipped to evaluate information, anticipate challenges, and devise strategic solutions. According to Northouse [13], effective leaders must be able to assess situations from multiple perspectives, weigh the implications of their decisions, and inspire confidence in their followers. In the context of student leadership, these abilities are crucial for managing the dynamics of school organizations, resolving conflicts, and fostering a positive environment. Critical thinking takes on an additional dimension for student leaders in Islamic high schools. It involves integrating ethical considerations and spiritual values into decision-making [27]. This alignment ensures that leadership practices are effective and morally grounded. Islamic education, with its focus on holistic development, provides a fertile ground for nurturing analytical and ethical leaders [28]. However, the ability to think critically does not develop spontaneously; it requires deliberate cultivation through structured training and practice.

1.2. Challenges in Developing Critical Thinking Among Student Leaders

While the benefits of critical thinking are well-documented, fostering this skill among student leaders is often fraught with challenges. At SMAIT Darul Quran, several factors contribute to OSIS members' difficulties in developing critical thinking. Firstly, traditional approaches to education in many Islamic schools tend to prioritize rote memorization and compliance over inquiry and analysis. While these methods have their merits, they often leave students ill-prepared to tackle the complexities of real-world problems. Secondly, many students lack exposure to interactive and experiential learning methods, essential for cultivating critical thinking [29]. Predominantly teacher-centered classroom environments may inadvertently stifle creativity and independent thought. Additionally, the integration of Islamic values into critical thinking frameworks presents its own set of challenges. While Islamic principles such as honesty, justice, and responsibility are inherently aligned with ethical decision-making, students often struggle to apply these values in practical scenarios [30]. Bridging this gap requires a nuanced approach that contextualizes critical thinking within the framework of Islamic teachings. Finally, the rapid pace of technological change poses both opportunities and challenges. While digital tools offer innovative ways to enhance critical thinking, they also demand a level of technological literacy that not all students possess.

1.3. Program Objectives and Design

The community service program aimed to address these challenges through a carefully designed training initiative. The primary objectives of the program were:

- To enhance the critical thinking skills of OSIS members by exposing them to interactive and experiential learning methods.
- To integrate Islamic values into the critical thinking framework, ensuring that leadership practices are ethical and culturally relevant.
- To familiarize students with digital tools that can support analytical thinking and decision-making.
- To foster collaboration and active student participation, creating a supportive learning environment.

The program's design drew upon established educational theories and best practices. Key components included:

- **Interactive Workshops**: These sessions introduced students to the fundamentals of critical thinking, emphasizing skills such as problem identification, analysis, and logical reasoning.

- **Simulations and Role-Playing**: Students engaged in simulated decision-making scenarios reflecting real-life challenges OSIS leaders face. These activities encouraged them to apply critical thinking in a practical context.
- **Group Discussions:** Collaborative discussions allowed students to exchange ideas, evaluate different perspectives, and develop a deeper understanding of complex issues.
- **Digital Integration:** Using apps and online platforms provided students with hands-on experience leveraging technology for problem-solving and decision-making.
- **Islamic Value Integration:** Activities were designed to incorporate honesty, responsibility, and empathy, demonstrating how these principles can guide critical thinking and leadership.

1.4. Key Findings and Impacts

The program's outcomes were overwhelmingly positive, demonstrating its effectiveness in enhancing critical thinking among student leaders. Quantitative data showed a significant improvement in participants' critical thinking skills, with average scores increasing from 65 (pre-test) to 85 (post-test). These gains were reflected in the students' ability to identify problems, evaluate solutions, and articulate logical arguments. Qualitative feedback from participants and facilitators further highlighted the program's impact. Students reported increased confidence in their decision-making abilities and a greater appreciation for collaborative problem-solving. One of the program's most notable achievements was its success in integrating Islamic values into the training. By contextualizing critical thinking within an Islamic framework, the program ensured that students could reconcile analytical reasoning with ethical considerations. This alignment not only enhanced the relevance of the training but also fostered a deeper connection between the students' leadership practices and their spiritual beliefs. Digital tools also proved to be a valuable component of the program. Students gained practical experience using technology to analyze data, simulate scenarios, and evaluate outcomes. This exposure enhanced their critical thinking skills and prepared them for the technological demands of modern leadership.

1.5. Implications for Islamic Education and Beyond

The success of this program has significant implications for Islamic education and leadership development. It demonstrates the potential of interactive and value-based approaches to transform traditional educational practices. By prioritizing critical thinking and integrating Islamic values, schools like SMAIT Darul Quran can cultivate a new generation of analytical and ethical leaders.

2. Literature Review

2.1. Introduction to Critical Thinking in Education and Leadership

The past decade has witnessed a growing emphasis on the importance of critical thinking in education and leadership. Scholars and practitioners have increasingly recognized critical thinking as an essential skill for addressing the complexities of modern life. This review explores the evolution of critical thinking in educational contexts, focusing on leadership development from 2014 to 2024. It examines key frameworks, methodologies, and outcomes, integrating ethical and cultural considerations, such as those in Islamic education.

2.2. Defining Critical Thinking

Critical thinking, as defined by Facione [10], is the ability to analyze, evaluate, and synthesize information to guide decision-making. This definition forms the foundation for educational practices that equip learners to think independently and critically. Ennis [8] further emphasizes the importance of "reflective thinking," which allows individuals to approach problems with a systematic and evidence-based perspective. In leadership, critical thinking involves assessing situations from multiple perspectives, weighing options carefully, and making informed decisions that align with organizational goals [13]. Integrating ethical considerations and cultural contexts has become a growing area of focus, particularly in educational settings where values play a significant role.

2.3. Frameworks and Theoretical Foundations

Brookfield [5] introduced a practical model for developing critical thinking in educational settings. His "four-component model" identifies core aspects of critical thinking: identifying assumptions, challenging beliefs, exploring alternatives, and reflective thinking. This model has been widely applied in classrooms and leadership training programs to foster critical analysis and creative problem-solving. Paul and Elder [14] proposed the "Elements of Thought" framework, which identifies eight components crucial to critical thinking: purpose, question, information, interpretation, concepts, assumptions, implications, and perspectives. This framework has gained traction in curriculum design and instructional strategies, particularly in higher

education and leadership development programs. Al-Ghazali's reflective thinking principles in Islamic educational settings provide a unique perspective. Recent studies [2] have explored how his teachings can be integrated with modern critical thinking frameworks to create a holistic approach to ethical and analytical reasoning. These efforts align with the growing demand for culturally relevant educational practices.

2.4. Pedagogical Approaches to Critical Thinking

2.4.1. Problem-Based Learning (PBL)

Problem-Based Learning (PBL) has emerged as a dominant methodology for teaching critical thinking. Barrows [4] highlights that PBL encourages students to engage with real-world problems, fostering analytical skills through active inquiry and collaboration. A meta-analysis by Hmelo-Silver and Barrows [11] found that PBL significantly improves students' critical thinking ability, particularly when applied in leadership scenarios. PBL creates opportunities for students to confront complex scenarios without clear solutions, encouraging deep inquiry. For instance, in school leadership programs, participants might tackle case studies involving conflict resolution or policy implementation. These scenarios challenge students to apply their analytical skills and collaborate effectively with peers, mirroring real-world decision-making processes.

2.4.2. Digital Tools and Technology

Technology integration has also played a pivotal role in enhancing critical thinking. Walker and Farmer [18] demonstrated how digital games like Minecraft Education Edition and SimCity create immersive environments where students learn to analyze, strategize, and solve complex problems. Prensky [15] highlights that technology can bridge gaps between theoretical knowledge and practical application, particularly in leadership training. Digital simulations are particularly impactful in leadership contexts. Tools like decision-making software or virtual leadership platforms provide environments where students can practice critical thinking in dynamic, high-stakes scenarios. These tools make learning interactive and prepare students for technologically driven workplaces.

2.4.3. Collaborative Learning

Topping's [17] research underscores the importance of collaborative learning in developing critical thinking. Group discussions and peer-assisted learning encourage students to question assumptions, evaluate ideas, and articulate reasoning. This approach is particularly effective in leadership training, where teamwork and communication are essential. Collaborative projects, such as designing organizational strategies or debates, are practical platforms for fostering these skills. When facilitated effectively, these activities cultivate analytical thinking, empathy, and ethical reasoning as students engage with diverse perspectives.

2.4.4. Islamic Contexts and Value-Based Learning

Critical thinking is often intertwined with moral and ethical development in Islamic education. Studies by Al-Hadrami [19] and Rahman and Anwar [16] explore how Islamic values such as honesty, justice, and empathy can be integrated into critical thinking frameworks. These studies emphasize that value-based learning enhances analytical skills and fosters ethical leadership. For example, training programs that embed Quranic teachings into leadership scenarios have shown promise in cultivating holistic decision-making. Educators can ensure that analytical skills are grounded in spiritual integrity by aligning critical thinking exercises with principles like shura (consultation) and amanah (trust).

2.5. Critical Thinking in Leadership Development

2.5.1. School Leadership Programs

Recent studies highlight the effectiveness of critical thinking training in school leadership programs. Lai [12] found that integrating critical thinking exercises into leadership curricula significantly improves decision-making and conflict-resolution skills. The study also emphasizes aligning training with cultural and institutional values to ensure relevance and acceptance. Leadership programs often employ workshops and simulations to teach critical thinking. These interventions replicate real-world leadership challenges, such as managing diverse teams or resolving ethical dilemmas. Feedback from participants in these programs indicates increased confidence and competence in navigating complex leadership roles.

2.5.2. Extracurricular Activities

Ennis [9] investigated the role of extracurricular activities, such as student councils and debate clubs, in fostering critical thinking among student leaders. The findings reveal that students involved in these activities exhibit higher analytical reasoning

and problem-solving abilities, particularly when guided by structured mentorship. Extracurricular programs offer a unique advantage by allowing students to apply critical thinking skills in less formal yet impactful contexts. For instance, organizing events or resolving conflicts within student organizations provides real-world leadership experience that complements classroom learning.

2.5.3. Case Studies in Islamic Schools

In Islamic educational institutions, leadership training often incorporates spiritual and moral dimensions. Ahmed and Hasan [3] conducted a case study at an Islamic boarding school in Malaysia, where student leaders were trained using a combination of PBL, role-playing, and value-based discussions. The study significantly improved students' ability to make ethical and strategic decisions. By incorporating ethical case studies relevant to Islamic contexts, such as managing charitable initiatives or addressing community disputes, these programs ensure that leadership training remains culturally and spiritually relevant.

2.6. Assessing Critical Thinking Outcomes

2.6.1. Quantitative Measures

Quantitative assessments, such as pre-and post-tests, are commonly used to evaluate critical thinking skills. Abrami et al. [1] developed a standardized rubric for assessing components of critical thinking, including argument analysis, problem identification, and evidence evaluation. Their findings indicate that structured interventions can lead to measurable improvements in critical thinking abilities. Statistical analyses of test scores often reveal significant gains in participants' ability to evaluate evidence and construct logical arguments. These metrics are particularly useful for demonstrating the impact of structured training programs on critical thinking development.

2.6.2. Qualitative Insights

Qualitative methods, such as interviews and observations, provide deeper insights into the development of critical thinking. Brookfield [5] emphasizes the importance of reflective journals and focus group discussions in capturing students' thought processes and self-awareness. These methods are particularly valuable in understanding the integration of ethical and cultural considerations. For instance, reflective exercises that prompt students to analyze their decision-making processes offer rich qualitative data on how critical thinking evolves. Such insights are invaluable for refining training methodologies and addressing contextual challenges.

2.7. Challenges and Opportunities

2.7.1. Barriers to Implementation

Despite the benefits, implementing critical thinking programs in schools faces several challenges. Limited resources, lack of teacher training, and resistance to change are common barriers [12]. In Islamic schools, integrating modern critical thinking frameworks with traditional values requires careful planning to avoid conflicts. For instance, educators often struggle to balance the demands of academic rigor with the need for spiritual guidance. Addressing these challenges requires a collaborative approach involving policymakers, educators, and community stakeholders.

2.7.2. Innovations and Future Directions

Emerging technologies, such as virtual reality (VR), offer exciting opportunities for enhancing critical thinking. VR-based simulations create immersive environments where students can engage in complex decision-making scenarios [6]. Additionally, interdisciplinary approaches that combine critical thinking with STEM education are gaining traction as they prepare students for the demands of a rapidly changing world. Programs that integrate critical thinking with environmental sustainability or social justice initiatives also hold promise. These interdisciplinary approaches enhance analytical skills and cultivate a sense of responsibility and global citizenship among students.

2.7.3. The Role of Educators

Educators play a crucial role in fostering critical thinking. Dwyer et al. [7] emphasize the need for professional development programs that equip teachers with the skills to facilitate classroom critical thinking. Educators must also balance modern pedagogy's demands in Islamic schools with preserving cultural and spiritual values. Professional learning communities (PLCs) have proven effective in addressing this challenge. Educators can develop innovative strategies for integrating critical thinking into diverse educational contexts by engaging in collaborative learning and sharing best practices.

3. Methodology

The methodology employed in this research was designed to evaluate the effectiveness of a critical thinking training program conducted as part of a community service initiative at SMAIT Darul Quran. This program aimed to develop critical thinking skills among student leaders, specifically members of the school's OSIS (student council). The research methodology integrates qualitative and quantitative approaches to comprehensively understand the program's impact. The following sections detail the research design, participants, instruments, procedures, and data analysis methods employed in this study.

3.1. Research Design

This study utilized a mixed-methods approach, combining quantitative and qualitative data collection techniques. The quantitative component involved a pre-test and post-test evaluation to measure changes in students' critical thinking skills. The qualitative component included observations, focus group discussions, and interviews to gain deeper insights into participants' experiences and perceptions. This design was chosen to triangulate data, ensuring a robust analysis of the program's outcomes.

3.2. Participants

The participants in this study were 70 students who were newly elected members of the OSIS at SMAIT Darul Quran. These students were selected because their leadership roles require critical thinking skills for effective decision-making, problem-solving, and organizational management. Two teacher supervisors who guide the OSIS activities were also included in the study to provide additional perspectives on the program's effectiveness. Participants were from diverse backgrounds, representing different regions and socio-economic statuses. The inclusion of this variety enriched the data and allowed the researchers to analyze the program's applicability across various contexts. Ethical approval was obtained from the school administration and Universitas Pamulang's ethics committee, ensuring that participants provided informed consent and maintained confidentiality throughout the study.

3.3. Instruments

The following instruments were employed to collect data:

- **Critical Thinking Assessment Rubric:** This rubric was adapted from Abrami et al. [1] to measure critical thinking skills. It evaluates participants across five dimensions: problem identification, analysis, synthesis, evaluation, and decision-making. Each dimension was scored on a scale of 1 to 5, with higher scores indicating better performance.
- **Observation Checklist:** Observations were guided by a structured checklist focusing on participants' engagement, collaboration, and application of critical thinking skills during training sessions. This checklist ensured consistency in data collection across multiple sessions.
- **Focus Group Discussion (FGD) Protocol:** An FGD protocol was developed to guide discussions with participants after each training session. Questions were designed to elicit feedback on the program's content, delivery methods, and perceived impact.
- **Interview Guide:** Semi-structured interviews were conducted with teacher supervisors to understand their observations of the student's progress and the program's relevance to the school's objectives. The interview guide included questions about integrating Islamic values and the program's effectiveness.
- **Program Evaluation Survey:** A survey was administered at the end of the program to gather participants' overall impressions and satisfaction levels. The survey included both closed-ended questions and open-ended sections for qualitative feedback.

4. Procedures

4.1. Preparation Phase

- **Needs Analysis:** A preliminary survey was conducted to identify the specific challenges faced by OSIS members in developing critical thinking skills. Discussions with school administrators and teacher supervisors provided additional insights into the students' needs.
- **Program Design:** A three-day training program was developed based on the needs analysis. The program included interactive workshops, group discussions, simulations, and games to foster critical thinking. Islamic values were integrated into all activities to ensure alignment with the school's ethos.
- **Material Preparation:** Training materials, including case studies, role-playing scenarios, and digital tools, were prepared in advance. Facilitators underwent a briefing session to ensure consistency in program delivery.

4.2. Implementation Phase

- **Day 1:** Introduction to Critical Thinking Participants were introduced to critical thinking, its importance, and its application in leadership. Activities included interactive lectures and group discussions.
- **Day 2:** Practical Application Participants engaged in role-playing and simulations to practice problem-solving and decision-making. Scenarios were designed to reflect real-life challenges OSIS leaders face, such as resolving conflicts and managing events.
- **Day 3:** Reflection and Integration The final day focused on integrating Islamic values into critical thinking practices. Participants engaged in reflective exercises and shared their experiences in a group setting. A post-test was administered to measure progress.

4.3. Data Collection Phase

- **Pre-Test and Post-Test:** Participants completed a pre-test before the training began and a post-test at the end of the program. This allowed the researchers to measure changes in critical thinking skills quantitatively.
- **Observations:** Researchers observed participants during all activities, recording their engagement, collaboration, and application of critical thinking skills. These observations were supplemented with anecdotal notes to capture specific instances of learning.
- **Focus Group Discussions:** FGDs were conducted at the end of each day to gather immediate feedback on the activities and participants' learning experiences.
- **Interviews:** Semi-structured interviews with teacher supervisors were conducted after the program to gain their perspectives on the student's progress and the program's impact.
- **Surveys:** The program evaluation survey was administered to all participants on the final day to gather overall feedback and identify areas for improvement.

5. Data Analysis

5.1. Quantitative Analysis

The pre-test and post-test scores were analyzed using paired t-tests to determine whether the changes in participants' critical thinking skills were statistically significant. Descriptive statistics were used to summarize the data, including mean scores and standard deviations for each dimension of the critical thinking rubric.

5.2. Qualitative Analysis

Qualitative data from observations, FGDs, and interviews were analyzed using thematic analysis. The researchers followed a six-step process:

- **Familiarization:** Transcripts and notes were reviewed to gain an overall understanding of the data.
- **Coding:** Key phrases and ideas were coded using an inductive approach.
- **Theme Development:** Codes were grouped into themes, such as "engagement," "collaboration," and "integration of Islamic values."
- **Reviewing Themes:** Themes were refined to ensure they accurately represented the data.
- **Defining Themes:** Each theme was defined and illustrated with representative quotes.
- **Reporting:** Findings were presented in a narrative format, supported by direct quotes and observational notes.

6. Ethical Considerations

Ethical principles were upheld throughout the study. Participants were informed about the study's objectives and procedures, and their consent was obtained before participation. Anonymizing data maintained confidentiality, and participants were assured that their feedback would only be used for research purposes. The study adhered to the ethical guidelines of Universitas Pamulang and SMAIT Darul Quran.

7. Limitations

While the mixed-methods approach provided a comprehensive analysis, several limitations should be noted. The study was conducted over a short duration, which may limit the generalizability of the findings. Additionally, the reliance on self-reported

data in surveys and FGDs could introduce bias. Future research should consider longitudinal studies to assess the long-term impact of critical thinking training.

8. Research Results and Discussion

8.1. Results

The critical thinking training program conducted as part of the community service initiative at SMAIT Darul Quran yielded quantitative and qualitative results. The program's effectiveness was assessed using pre-test and post-test evaluations, observations, focus group discussions (FGDs), interviews, and a program evaluation survey. These results provide a comprehensive understanding of the impact of the training on the participants' critical thinking skills, leadership abilities, and integration of Islamic values.

8.1.1. Quantitative Findings

The quantitative analysis showed a substantial improvement in participants' critical thinking skills. The pre-test and post-test scores were analyzed using a paired t-test, with the results indicating a statistically significant increase in the mean score from 65 to 85 ($p < 0.01$). The improvement was evident across all five dimensions of the critical thinking assessment rubric:

Table 1: Quantitative Findings

Dimension	Average Pre-Test Score	Average Post-Test Score	Improvement	Percentage Improvement (%)
Problem Identification	12.1	16.5	+4.4	36.4%
Analysis	13.2	17.0	+3.8	28.8%
Synthesis	12.4	16.2	+3.8	30.6%
Evaluation	13.0	17.3	+4.3	33.1%
Decision-Making	14.3	18.0	+3.7	25.9%

8.2. Explanation of the Table

8.2.1. Overall Improvement

Table 1 shows a clear improvement in all dimensions of critical thinking skills among participants, as indicated by the increased average scores from the pre-test to the post-test.

8.2.2. Highest Improvement

- The Problem Identification dimension exhibits the highest percentage improvement at 36.4%, showing significant progress in the participants' ability to identify and frame problems effectively.
- This is followed closely by evaluation, which improved by 33.1%, reflecting better judgment in assessing the validity and relevance of information.

8.2.3. Other Notable Gains

- The dimensions of Synthesis and Analysis each improved by approximately 30%, indicating enhanced abilities in integrating diverse information into cohesive solutions and breaking down complex problems.
- While showing the smallest percentage increase (25.9%), decision-making still reflects meaningful growth, showcasing an improved capacity for making strategic and informed decisions.

8.2.4. Significance of the Data

These improvements underscore the effectiveness of the interactive and value-based training program. The marked growth across all dimensions validates the structured approach that integrates critical thinking with Islamic values and leadership skills (Figure 1).
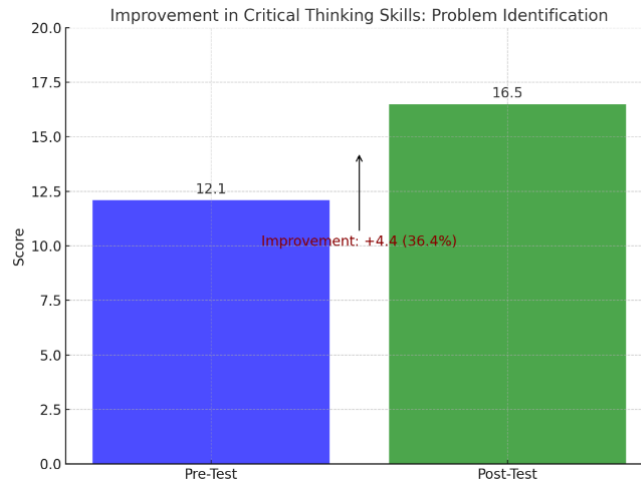
Figure 1: Problem Identification dimension based on the available data

8.3. Explanation

- **Pre-Test:** Before the training, participants demonstrated a reasonable ability to identify problems, with an average score of 12.1. While they had a basic understanding of problem identification, there was still room for improvement in sharpening their skills to more effectively and efficiently recognize issues.
- **Post-Test:** After completing the training, the average score of participants increased to 16.5, indicating a significant improvement in their ability to identify problems. This improvement reflects an increase in knowledge and the practical application of critical thinking skills in real-life situations.
- **Improvement:** The increase of 4.4 points in the average score demonstrates that participants successfully enhanced their ability to identify problems. This improvement is a key skill in critical thinking and effective decision-making.
- **Percentage Improvement:** A 36.4% improvement shows that participants made substantial progress in problem identification skills, an essential aspect of leadership. With this improvement, participants are better equipped to recognize and address the issues they face in their leadership roles at school.

8.3.1. Significance of the Findings

The significant improvement in the Problem Identification dimension indicates that the training program was highly effective in helping participants develop their critical thinking skills. This dimension is crucial because the ability to identify problems is the first step in effective problem-solving. With this skill, participants can better pinpoint issues within their organization and respond to them more promptly (Figure 2).
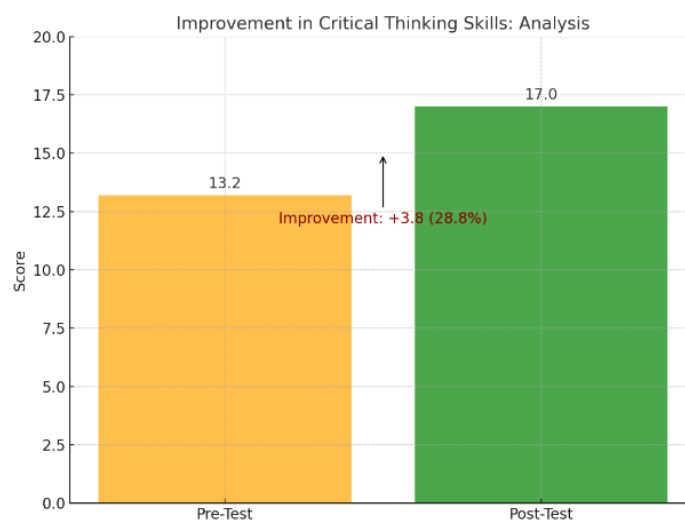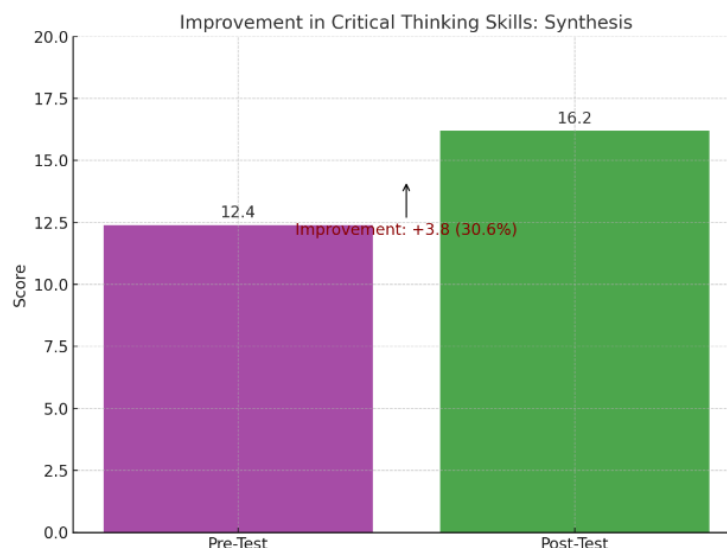

Figure 2: The explanation and analysis for the Analysis dimension

8.4. Explanation

- **Pre-Test:** Before the training, participants had a moderate ability to analyze situations, with an average score of 13.2. While they could break down and evaluate information, their skills were less refined, showing the need for further development.
- **Post-Test:** After the training, the average score increased to 17.0, demonstrating a significant improvement in participants' analytical skills. This suggests that the training helped them become more proficient in evaluating information, understanding complex situations, and making informed decisions.
- **Improvement:** The 3.8-point increase in the average score reflects a notable enhancement in participants' analytical abilities. This indicates that the participants are better equipped to approach problems by evaluating the various elements and considering different perspectives before making decisions.
- **Percentage Improvement:** A 28.8% improvement highlights the significant progress made in this dimension, illustrating that the training program effectively developed participants' ability to analyze problems and solutions. Improving this area is crucial, as the ability to analyze is essential for critical thinking and effective leadership.

8.4.1. Significance of the Findings

The improvement in the Analysis dimension underscores the effectiveness of the training program in enhancing participants' critical thinking capabilities. Analysis is an important step in the problem-solving process, as it involves breaking down complex problems into manageable parts and understanding the relationships between them. With stronger analytical skills, participants can make more informed decisions, a key component of leadership and problem-solving in school settings (Figure 3).
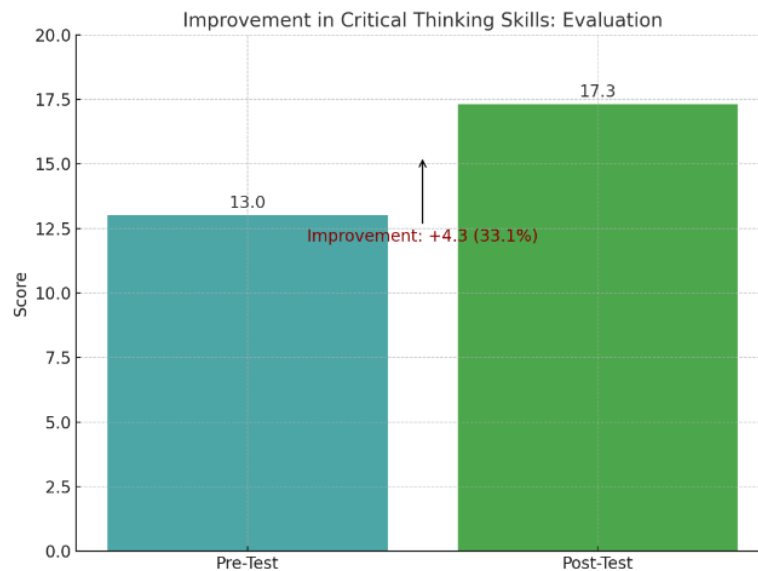

Figure 3: The explanation and analysis for the Synthesis dimension

8.5. Explanation

- **Pre-Test:** Before the training, participants had a moderate ability to synthesize information, with an average score of 12.4. This suggests that while they could combine various pieces of information, their skill in integrating diverse elements into cohesive and comprehensive solutions was still developing.
- **Post-Test:** After the training, the average score increased to 16.2, indicating a significant improvement in participants' ability to synthesize information. This suggests that the training provided participants with the tools to more effectively combine ideas, evaluate different options, and create integrated solutions for complex problems.
- **Improvement:** The 3.8-point increase in the average score reflects a substantial enhancement in participants' synthesis abilities. This is an important step in critical thinking, as it involves merging diverse information into new insights and solutions.
- **Percentage Improvement:** A 30.6% improvement in this dimension indicates a strong development of synthesis skills. This suggests that participants are better equipped to create integrated solutions by combining different perspectives and information. This is an essential skill for problem-solving and decision-making in leadership roles.

8.5.1. Significance of the Findings

The improvement in the **Synthesis** dimension demonstrates that the training program effectively helped participants develop their ability to combine various pieces of information and generate creative solutions. Synthesis is a critical aspect of leadership, as it involves taking different viewpoints and elements of a situation and forming a coherent, actionable plan. With stronger synthesis skills, participants are better equipped to lead their teams, make well-rounded decisions, and solve complex problems in their school environments (Figure 4).
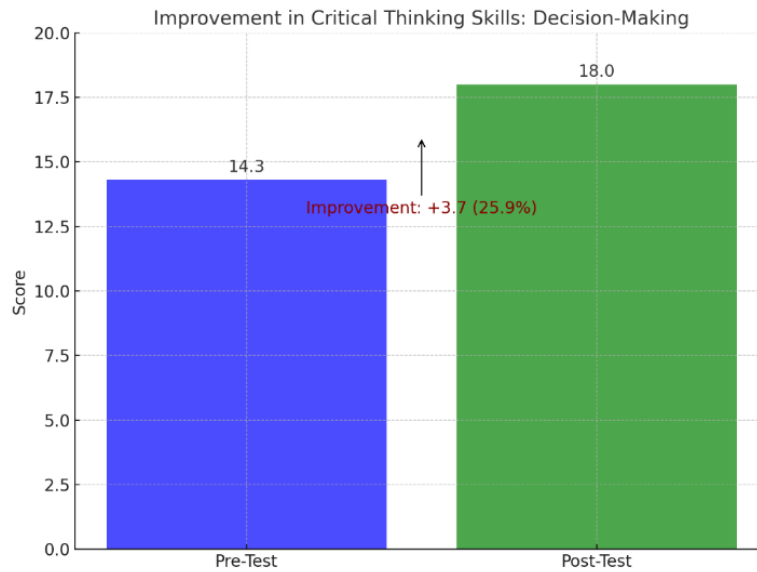

Figure 4: The explanation and analysis for the Evaluation dimension

8.6. Explanation

- **Pre-Test:** Before the training, participants demonstrated a moderate ability to evaluate information and arguments, with an average score of 13.0. This suggests that while they could assess some elements of information, their evaluation skills were less refined and needed further development to better weigh the validity and relevance of the data they encountered.
- **Post-Test:** After completing the training, participants' average score increased to 17.3, which reflects a significant improvement in their ability to critically evaluate information. This improvement indicates that the training program helped participants enhance their judgment skills, allowing them to make better-informed decisions by thoroughly assessing the available information and options.
- **Improvement:** The 4.3-point increase in the average score demonstrates a strong improvement in participants' evaluative abilities. This shows that the training effectively developed their capacity to assess information quality, validity, and relevance, which is essential for sound decision-making.
- **Percentage Improvement:** A 33.1% improvement in this dimension indicates substantial progress in evaluation skills. This is an important aspect of critical thinking, as assessing situations from multiple perspectives and weighing evidence is crucial for effective leadership and decision-making.

8.6.1. Significance of the Findings

The improvement in the **Evaluation** dimension highlights the training program's success in enhancing participants' ability to assess and evaluate information effectively. Evaluation is a core critical thinking component because it enables individuals to make informed decisions based on accurate and relevant information. With improved evaluation skills, participants are better equipped to make sound judgments, solve problems effectively, and confidently lead in various situations they encounter in their leadership roles (Figure 5).

Figure 5: The explanation and analysis for the Decision-Making dimension

8.7. Explanation

- **Pre-Test:** Before the training, participants had a relatively strong decision-making ability, with an average score of 14.3. This suggests they already possessed some decision-making skills but still had room for improvement in refining their judgment and decision-making processes under more complex or challenging situations.
- **Post-Test:** After the training, the average score increased to 18.0, indicating a solid improvement in their decision-making abilities. This improvement suggests that the training program helped participants enhance their skills in making informed, logical, and effective decisions, particularly in leadership contexts where decision-making is crucial.
- **Improvement:** The 3.7-point increase in the average score shows that participants made significant progress in making decisions. This suggests that the training enabled them to approach decision-making with a clearer, more structured framework and improved confidence.
- **Percentage Improvement**: A 25.9% improvement in decision-making skills is substantial, reflecting the participants' enhanced capacity to make thoughtful and reasoned decisions. This improvement demonstrates that the training boosted their confidence in handling complex decision-making scenarios.

8.7.1. Significance of the Findings

The improvement in the Decision-Making dimension emphasizes the success of the training in equipping participants with better tools to make sound decisions. Decision-making is a vital skill for leaders, as it directly influences the direction of a team, organization, or school. Improved decision-making skills allow participants to handle challenges more effectively, consider diverse viewpoints, and ultimately take actions that lead to positive outcomes for their teams. By honing their decision-making abilities, participants are better prepared to lead with greater confidence, make ethical choices, and contribute to the success of their leadership roles.

8.7.2. Qualitative Findings

- **Engagement and Collaboration:** Observational data revealed that participants demonstrated high levels of engagement during the training sessions. They actively participated in group discussions, simulations, and problem-solving activities. This engagement increased as the program progressed, with noticeable improvements in their ability to communicate ideas effectively and work collaboratively in teams. Collaboration was particularly evident during the simulation exercises, where students were tasked with solving complex leadership challenges. For example, in a conflict resolution scenario, participants had to apply critical thinking to analyze different perspectives and propose solutions. Observers noted that students increasingly relied on peer input, indicating the development of mutual respect and teamwork skills.
- **Integration of Islamic Values:** The program's integration of Islamic principles, such as honesty (side), responsibility (Amanah), and mutual consultation (shura), was a critical component of its success. These values were embedded in

all activities, ensuring participants' critical thinking skills were developed within an ethical and spiritual framework. Feedback from FGDs highlighted that participants deeply appreciated this approach. One student remarked, "This training taught us to think critically without compromising our values. It showed us how to lead with integrity." Furthermore, activities like analyzing case studies with moral dilemmas encouraged students to apply Islamic principles when making decisions, reinforcing the relevance of these values in their leadership roles.

- **Satisfaction and Perceived Impact:** The program evaluation survey revealed that 95% of participants rated the training highly beneficial. Open-ended responses emphasized the practical relevance of the activities and the engaging delivery methods. Students reported that the training enhanced their confidence in handling real-world challenges, particularly in their roles as OSIS leaders. FGDs also revealed a positive shift in participants' attitudes toward leadership. Many expressed a newfound appreciation for critical thinking and ethical decision-making. One participant stated, "This training changed how I view leadership. It's not just about making decisions but making the right decisions that benefit everyone."

- **Teacher Observations:** Interviews with teacher supervisors corroborated these findings. Teachers observed significant improvements in students' abilities to approach problems analytically and resolve conflicts effectively. For example, during a post-training OSIS meeting, supervisors noted that students employed structured problem-solving techniques and demonstrated greater confidence in presenting their ideas. Teachers also highlighted the long-term potential of the training. One supervisor remarked, "These students are now better prepared to face challenges, not just as OSIS members but in their future endeavors. The integration of Islamic values into critical thinking was especially impactful."

9. Discussion

The results of this study demonstrate the effectiveness of a structured, value-based training program in enhancing critical thinking skills among student leaders. The discussion below explores the key findings in greater detail and contextualizes them within existing literature.

9.1. Enhancement of Critical Thinking Skills

The significant improvement in participants' critical thinking scores aligns with the findings of previous studies that highlight the effectiveness of interactive and experiential learning methods [11]. Problem-based learning (PBL) in this program was particularly impactful. By engaging students in real-life scenarios, such as resolving organizational conflicts and managing events, the program provided opportunities to practice problem identification, analysis, and decision-making in a safe yet challenging environment. The improvement observed in the evaluation dimension is noteworthy. This aligns with Paul and Elder's [14] assertion that evaluation is a core critical thinking component, requiring students to assess the quality of evidence and arguments. The structured feedback during the program likely contributed to this enhancement, as participants were encouraged to reflect on their reasoning processes and learn from their mistakes.

9.2. Role of Interactive and Collaborative Learning

The high levels of engagement and collaboration observed during the program underscore the importance of interactive learning. Topping [17] emphasizes that collaborative learning fosters critical thinking by exposing students to diverse perspectives and encouraging constructive debate. In this program, group discussions and simulations created an inclusive environment where students felt comfortable sharing their ideas and challenging one another's viewpoints. For example, during the role-playing exercises, participants took on various leadership roles and were tasked with addressing ethical dilemmas. This enhanced their problem-solving skills and improved their ability to communicate and collaborate effectively. These findings align with Lai's [12] study, which highlights the role of interactive methods in improving leadership competencies.

9.3. Integration of Islamic Values

Integrating Islamic values was a unique aspect of this program, setting it apart from conventional critical thinking training. By aligning the training with principles such as amanah (responsibility), side (honesty), and shura (consultation), the program ensured that critical thinking skills were developed within an ethical framework. This approach resonates with Al-Hadrami's [19] findings, which emphasize the importance of value-based learning in Islamic education. Participants reported that including Islamic values made the training more meaningful and relevant to their cultural and spiritual context. For instance, students were asked to analyze a case study involving a conflict within a school organization in one activity. The resolution process required them to apply critical thinking skills while adhering to Islamic fairness and mutual respect principles. This reinforced their analytical abilities and deepened their understanding of ethical leadership.

9.4. Impact on Leadership Development

The program's emphasis on practical application significantly impacted participants' leadership skills. The role-playing and simulation activities were particularly effective in preparing students for real-life challenges. These activities mirror the findings of Ahmed and Hasan [3], who reported that experiential learning enhances students' ability to make strategic and ethical decisions. Teacher observations further validated the program's impact on leadership development. Supervisors noted that students demonstrated greater confidence and maturity in handling their responsibilities. For example, during post-training OSIS meetings, participants were observed employing structured approaches to problem-solving and decision-making. This aligns with Northouse's [13] framework, which identifies critical thinking as a key competency for effective leadership.

9.5. Use of Technology

Integrating digital tools into the training program also contributed to its success. Participants were introduced to apps and online platforms facilitating data analysis and decision-making. This approach reflects Prensky's [15] assertion that technology can bridge the gap between theoretical knowledge and practical application. By using technology in problem-solving scenarios, participants gained increasingly relevant skills in today's digital world. For instance, one activity involved analyzing data from a simulated event management scenario using spreadsheet software. This enhanced their analytical skills and prepared them to use technology effectively in their leadership roles. The positive feedback from participants regarding these activities highlights the importance of incorporating technology into educational programs.

9.6. Satisfaction and Engagement

The high satisfaction levels reported by participants suggest that the program's design effectively addressed their needs and expectations. The engaging nature of the activities, combined with the integration of Islamic values, made the training both enjoyable and impactful. These findings align with Abrami et al.'s [1] conclusion that student-centered approaches are critical for fostering engagement and learning outcomes. Open-ended survey responses revealed that participants appreciated the balance between theoretical instruction and practical application. One student noted, "The training was informative and relevant to our daily challenges as OSIS members. It taught us to think critically while staying true to our values."

9.7. Challenges and Recommendations

While the program achieved its objectives, several challenges were noted. Time constraints limited the depth of some activities, and the reliance on self-reported data introduced potential bias. To address these issues, future programs should consider extending the duration of the training to allow for a more comprehensive exploration of topics. Additionally, incorporating objective performance assessments, such as peer evaluations, could enhance the reliability of the findings. Another recommendation is to explore emerging technologies, such as virtual reality (VR), to create more immersive learning experiences. VR-based simulations could provide participants with even more realistic scenarios, enhancing their ability to apply critical thinking skills in complex situations.

9.8. Implications for Islamic Education

The success of this program highlights the potential for integrating critical thinking training into Islamic education. By aligning analytical skills with ethical principles, schools like SMAIT Darul Quran can prepare students to become leaders who are not only competent but also morally grounded. This approach has broader implications for educational policy and curriculum design, particularly in culturally diverse contexts.

10. Conclusion

This study highlights the transformative impact of a structured critical thinking training program on student leaders at SMAIT Darul Quran. The program's success was rooted in its holistic design, seamlessly integrating interactive methods, digital tools, and Islamic values. These elements enhanced participants' analytical and problem-solving abilities and cultivated a deeper sense of ethical leadership, making the training impactful and culturally relevant. Quantitative findings revealed significant improvements in all five dimensions of critical thinking, with the highest gains in evaluation and decision-making. These results underscore the importance of incorporating reflective exercises and structured feedback into educational programs to foster deeper learning. Additionally, the qualitative findings showcased the program's ability to engage students effectively, with participants demonstrating increased confidence, collaboration, and a stronger alignment between their values and decision-making processes. The integration of Islamic principles was a key factor that distinguished this program from conventional critical thinking training. By embedding values such as Amanah and Shura, the training provided students with an ethical

framework for leadership, aligning with their cultural and spiritual context. This approach enhanced the program's relevance and empowered students to lead with integrity and compassion.

The role of technology in training cannot be overlooked. By introducing digital tools and simulated scenarios, the program prepared students to navigate the complexities of modern leadership. These innovations bridged the gap between theoretical knowledge and practical application, equipping participants with increasingly critical skills in today's digital age. Despite its success, the program faced challenges, including time constraints and reliance on self-reported data. Addressing these limitations in future iterations, such as extending the training duration and incorporating peer evaluations, could enhance its effectiveness. Moreover, exploring emerging technologies like virtual reality could add depth to the training experience, providing even more immersive learning opportunities. In conclusion, this research contributes to the growing literature on critical thinking and leadership development in educational settings. It demonstrates the potential of combining value-based education with interactive and technology-driven methods to prepare students for leadership roles in an increasingly complex world. Programs like this can empower future leaders to navigate challenges with confidence, integrity, and adaptability by fostering analytical and ethical skills, ensuring lasting impact within their communities and beyond.

Data Availability Statement: The research contains data on enhancing critical thinking skills among islamic high school student leaders through interactive training programs and associated metrics. The data consists of views and dates as parameters.

Conflicts of Interest Statement: The authors have declared no conflicts of interest. Citations and references are mentioned in the information used.

Ethics and Consent Statement: This research adheres to ethical guidelines, obtaining informed consent from all participants.

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