*Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*
*http://ojs.ikipmataram.ac.id/index.php/prismasains/index*
*e-mail: prismasains.pkpsm@gmail.com*

*December 2019. Vol. 7, No. 2*
*p-ISSN: 2338-4530*
*e-ISSN: 2540-7899*
*pp. 180-191*

# The Effectiveness of Using the Islamic Integration Module on the Critical Thinking Ability of Madrasah Ibtidaiyah Students

**[1*]Ummu Khairiyah, [2]Silviana Nur Faizah**
[1,2] Department of Teacher Education in Madrasah Ibtidaiyah (PGMI), Faculty of Islamic Religion, Universitas Islam Lamongan, Jl. Veteran No. 53A, Lamongan 62211, Indonesia
*Corresponding Author e-mail: ummukhairiyah@unisla.ac.id

Received: October 2019; Revised: November 2019; Published: December 2019

**Abstract**

This study assesses the effectiveness of the integrated thematic modules of Islamic values on students' critical thinking abilities. The pre-experimental research with One Group Pretest Posttest Design was conducted. The sample was 21 students of Class 3 Madrasah Ibtidaiyah (MI) taken with the saturated sampling technique. Five critical questions were used, namely: (1) formulating the problem, (2) planning a problem-solving strategy, (3) making a decision, (4) analyzing the problem, and (5) evaluating the decision. The data were analyzed descriptively and statistically using paired samples test. The results show that the critical thinking ability was very critical in the category of 48%, critical 24%, quite critical 19%, and less critical 10%. Students' critical thinking abilities have improved after learning using Islamic thematic integration modules (N-gain = 0.5) with the medium category. Statistical test results show that the module has a significant impact (p> 0.05). Based on these results, it can be concluded that the use of integrated thematic modules is effective and can be further implemented.

**Keywords:** Islamic integration; Thematic Module; Critical thinking ability

***How to Cite:*** Khairiyah, U., & Faizah, S., N. (2019). The Effectiveness of Using the Islamic Integration Module on the Critical Thinking Ability of Madrasah Ibtidaiyah Students. *Prisma Sains: Jurnal Pengkajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram*, *7*(2), 180-191. doi:https://doi.org/10.33394/j-ps.v7i2.1780

https://doi.org/10.33394/j-ps.v7i2.1780



## INTRODUCTION

Education in Indonesia has experienced curriculum changes several times. The current Curriculum is the 2013 curriculum, referring to 21st-century skills (Khairiyah, 2017). It expects students to be productive, creative, innovative, and effective in order to be able to contribute actively in society, nation, state and world civilization (Idi, 2014). The 21st-century skills are essential, which comprises of learning and innovation skills, information media and technology skills, carrier and life skills (Triling & Fadel, 2009; Khairiyah, 2017). Based on this description, life skills must be possessed by students to prepare themselves in facing future demands, one of which is the ability to think.

In general, thinking is considered as a cognitive process, a mental act to gain knowledge. Thinking is a complex and reflective endeavour (Costa, 1985). The ability to think implies that thinking can be taught and requires exercises like other abilities. In line with this opinion, Arends (2012) states that the ability to think always develops and can be taught. One of the ability to think claimed as an essential ability of the 21st century is the ability to think critically (Prayogi et al., 2018) which was allegedly a priority of research and learning in various disciplines (Fitriani et al., 2019). Therefore, it is important to be trained through learning so that students have the stock in deciding ideas in the life to come. Learning process that empower students in an active role starting from thinking, asking, observing, discovering, reflecting and constructing is the one that enhances students' critical thinking (Hasruddin, 2009). According to Dewey (1933), critical thinking is reflective

thinking which involves the suspension of judgment, maintenance of healthy scepticism and the practice of open thinking. Moreover, Leen et al (2014) identify critical thinking as an activity that called for, active, persistent, and careful in considering what would be trusted or done.

Critical thinking is the process of determining conclusions based on what is sought and what must be done, not just looking for answers; but the process of questioning answers, facts, or information available (Hastuti, 2009). It uses the cognitive abilities or the strategies that can increase the chances of things to be obtained including the process of solving problems, formulating influential factors, calculating various possibilities and making decisions (Helpern, 2013). Ones who have critical thinking believe that many situations can be resolved through critical and reflective thinking (Fisher, 2008; Ennis, 2011). The ability to think critically between each individual cannot be compared, because critical thinking is a mental process that can develop in accordance with the activities undertaken and the problems being solved. The ability to think critically requires students to play an active role in learning by conducting analysis, evaluation, and creation (Conklin, 2012) which aims to prove a problem, express what happened and solve the problem (Facione, 2011). Ennis (1991) and Leen et al. (2014) state that experts agree that critical thinking consists of (1) cognitive skills in interpretation, analysis, evaluation, conclusions, explanations and self-regulation; and (2) disposition of thinking which includes truth-seeking, open-mindedness, analytic, systematic, curiosity, maturity of judgment, the need for cognition, curiosity, and tolerance for ambiguity.

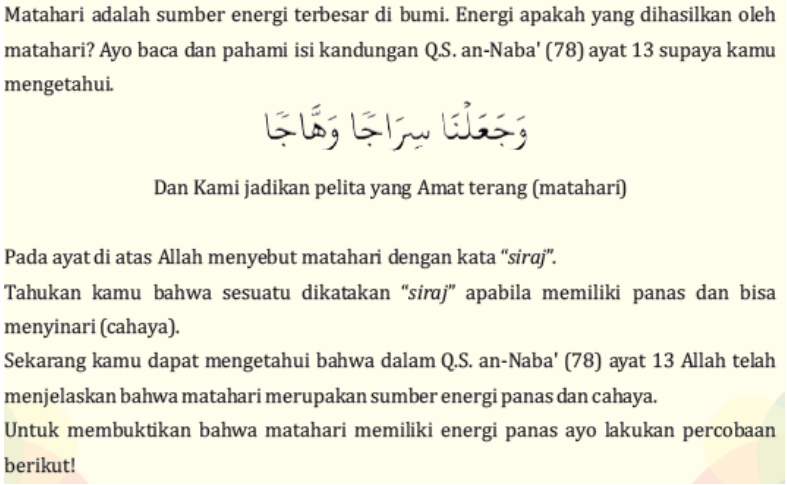
Research have demonstrated that it is important to equip students with critical thinking abilities from an early age through learning in school to be able to solve authentically critical problems in everyday life and is an inseparable part of education to prepare citizens who are active in responding and resolving various problems and unclear information (Angeli & Valanides, 2009). As stated by the government through Permendikbud No. 81a stressed that critical thinking abilities must be part of the abilities developed in learning activities, despite the fact that the government has not fully developed thematic books of students who are able to practice their critical thinking abilities. On the other hand, Nawawi and Wijayanti (2018) state that choosing and deciding ideas in the 21st century is not only related to the critical thinking abilities, students must also have the ethical foundation and norms governed in religion. In line with this opinion Kunandar (2008) states that in learning, balancing high academic mastery and spiritual-based character emphasis can make provision for students to win the global competition.

Various efforts also made by the government in the 2013 Curriculum. Indonesia government has established guidelines for implementing the 2013 curriculum including the implementation of the thematic leaning classes. The 2013 curriculum thematic books implemented nationally have not fully raised the spiritual aspect, so it is necessary to develop thematic books according to the needs of certain institutions or regions. The use of teaching materials that cover the four core competencies in one learning becomes a necessity so that students get a balance of intellectual and spiritual knowledge. In fact, both the intellectual and spiritual aspects have not been optimally packaged yet in the 2013 curriculum students 'thematic books. with the lack of the content of the Religious aspect, mainly Islamic Values of the Students' thematic books, such as in studying the themes of energy and changes in spiritual aspects. While based on intellectual aspect, learning activities in students 'books are limited to experimental activities, while at the reporting stage, students are not directed how to compile reports that are appropriate to the experimental activities, so that learning activities in students' thematic books have not been able to direct students to think critically at the elementary school level.

The use of relevant modules or instructional materials according to the demands that have been described is important in primary schools. The teaching materials are the foundation of learning in the classroom (Muslich, 2010) that will lead the students to be more

structured in learning. Therefore, students do not lack information and knowledge. The research result related to the learning process based on the integration of Islamic science was conceded by Koiri et al. (2017) who found the outcomes of student learning activeness, outcomes, and the increased of creativity after the learning process. On the other hand, Aji's research (2014) developed Islamic character-based science modules through a scientific approach which was proven improved the student learning outcomes. A recent study by Nawawi and Wijayanti (2018) who developed a biology assessment based on critical thinking abilities integrated with Islamic values stated that the biological assessments developed were valid and reliable to measure the critical thinking abilities integrated with Islamic values in students. The results of the previous research described focus on the integration of Islam for cognitive learning outcomes and critical thinking of high school students and have not been applied or adjusted to the measurement of critical thinking of primary school students. The novelty of this study is on testing the effectiveness of the thematic integration module of Islam in elementary school or Madrasah Ibtidaiyah students.

The thematic module of the integration of Islam and science was a teaching material developed to integrate the Qur'an with the concepts students will learn, namely on the theme of energy and its changes so that this integration can enable students to develop their spiritual abilities after learning about the theme of energy and its changes. Besides, a thematic module on the integration of Islam and science was also compiled using an inquiry approach that enables students to develop critical thinking abilities (Faizah, 2018). Some examples of the integration of Islam and student-oriented activities that are contained in the thematic modules used in this study are presented in Figure 1, Figure 2, and Figure 3.



Matahari adalah sumber energi terbesar di bumi. Energi apakah yang dihasilkan oleh matahari? Ayo baca dan pahami isi kandungan Q.S. an-Naba' (78) ayat 13 supaya kamu mengetahui.

وَجَعَلْنَا سِرَاجًا وَهَّاجًا

Dan Kami jadikan pelita yang Amat terang (matahari)

Pada ayat di atas Allah menyebut matahari dengan kata *"siraj"*.
Tahukan kamu bahwa sesuatu dikatakan *"siraj"* apabila memiliki panas dan bisa menyinari (cahaya).
Sekarang kamu dapat mengetahui bahwa dalam Q.S. an-Naba' (78) ayat 13 Allah telah menjelaskan bahwa matahari merupakan sumber energi panas dan cahaya.
Untuk membuktikan bahwa matahari memiliki energi panas ayo lakukan percobaan berikut!

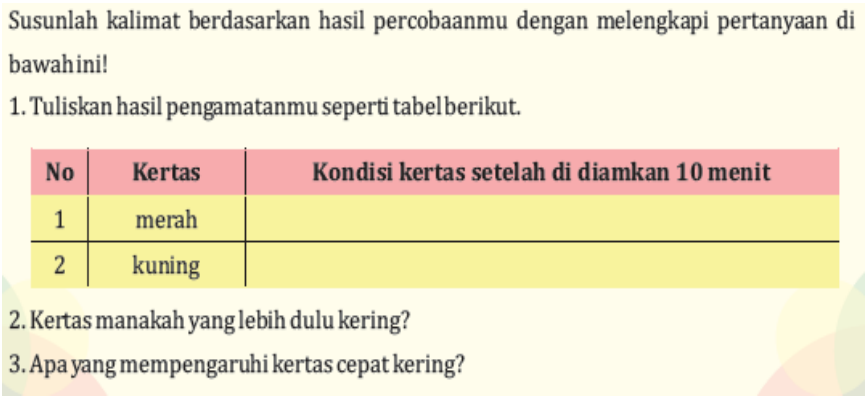
Figure 1. form of spiritual development abilities through the Islamic Science Integration

**Matahari adalah Sumber Energi**

**Tujuan:** Mengetahui panas matahari adalah sumber energi
**Alat dan bahan:**
1. Dua lembar kertas lipat berwarna merah dan kuning (dengan warna berbeda)
2. Air
3. Wadah

**Langkah Kerja:**
1. Masukkan kedua lembar kertas (merah dan kuning) ke dalam wadah berisi air dengan mencelupkan sebagian dari kertas seperti gambar di samping.
2. Simpanlah kertas merah ditempat yang panas dan lembar kertas kuning di dalam kelas (tidak terkena panas). Biarkanlah kira-kira 10 menit.
3. Setelah 10 menit ambil kedua kertas dan amatilah keadaan kedua kertas tersebut.

Figure 2. Experimental Activities for Practicing Critical Thinking Abilities



Susunlah kalimat berdasarkan hasil percobaanmu dengan melengkapi pertanyaan di bawah ini!

1. Tuliskan hasil pengamatanmu seperti tabel berikut.

| No | Kertas | Kondisi kertas setelah di diamkan 10 menit |
|---|---|---|
| 1 | merah | |
| 2 | kuning | |

2. Kertas manakah yang lebih dulu kering?
3. Apa yang mempengaruhi kertas cepat kering?

Figure 3. Reporting Activities to practice Critical Thinking Ability

The theme used was "energy and its changes with the sub-theme of energy change." Students were required to be actively involved in learning activities by carrying out practicum activities contained in learning. The emphasis on these activities was relevant to the statement of Leicester (2010) which states that involving students in learning activities can support the development of students' critical thinking abilities. The results of observations made at Madrasah Ibtidaiyah (MI) Salafiyah Curse Blora indicate that students have difficulty in solving problems with high levels of thinking. This is motivated by the implementation of learning conducted by teachers using the 2013 curriculum thematic books that has not been independently developed to improve students' critical thinking abilities, so students cannot be actively involved in learning activities. The use of Islamic thematic integration modules is very relevant to the problems outlined above. On the other hand, Islamic thematic integration modules have been declared valid to be used in the primary school science learning in terms of material, design, language, and learning (Faizah, 2018) but their effectiveness has not been tested in teaching critical thinking abilities.

The objective of this study was to assess the effectiveness of the use of integrated thematic modules of Islamic values and science on students' critical thinking abilities in MI Salafiyah Curse Blora. It consists of five indicators namely (1) formulating the problem (Ennis, 2011), (2) planning a problem-solving strategy (Ennis, 2011), (3) make decisions (Prayogi et al., 2017; Fitriani et al., 2019), (4) analyze the problem (Prayogi et al., 2018; Wahyudi et al., 2019; Paul & Elder, 2019), and (5) evaluating decisions (Vargas-Alfonso, 2015; Paul & Elder, 2019).

## METHOD

The pre-experimental research with One Group Pretest Posttest Design was conducted. The sample was 21 students of grade 3 Madrasah Ibtidaiyah Salafiyah Curse of Blora in the 2018/2019 academic year selected using saturated sampling (Goodwin, 2012). The test instrument used to measures the students' critical thinking abilities. The test used in research was the description test in the form of a non-objective description with answers in the form of free descriptions that require students to remember and organize personal opinions about things learned in the form of written descriptions (Arifin, 2016). The test used consisted of 5 items that had been tested for empirical validity on 15 students and were declared valid so that it could be used to measure students 'critical thinking abilities. The results of the validity test of students' critical thinking abilities test instruments are presented in Table 1.

Table 1. Instrument Validity Test Results

| Number of question | $r_{count}$ | $r_{table}$ | Remarks |
|---|---|---|---|
| 1 | 0.538 | | Valid |
| 2 | 0.525 | | Valid |
| 3 | 0.642 | 0.361 | Valid |
| 4 | 0.833 | | Valid |
| 5 | 0.598 | | Valid |

Five test items used are based on critical thinking indicators which include (1) formulating the problem, (2) planning a problem-solving strategy, (3) making a decision, (4) analyzing the problem, and (5) evaluating the decision. The pretest and posttest score of critical thinking abilities were analyzed using the equation [Final score = (Score obtained / Maximum score) x 100] (Asy'ari et al., 2019) which were further categorized using the five-scale Benchmark Reference Assessment (PAP) stated by (Setyowati, 2011) as presented in Table 2.

Table 2. Benchmark Reference Criteria (PAP) in Students' Critical Thinking Ability

| Value Range | Criteria |
|---|---|
| 81.25 – 100 | Very critical |
| 71.50 – 81.20 | Critical |
| 62.50 – 71.50 | Critical enough |
| 43.75 – 62.50 | Less critical |
| 0.00 – 43.75 | Uncritical |

Increasing the pretest and posttest scores for each indicator of students' critical thinking abilities were calculated using the equation [N-Gain = (post-score pretest scores) / (maximum score-pretest score)] (Hake, 1999) and converted based on categorisation as presented in Table 3.

Table 3. The n-gain criteria (Hake, 1999).

| Score | Category |
|---|---|
| 0.70 < n-gain | high |
| 0.30 ≤ n-gain ≤ 0.70 | medium |
| n-gain < 0.30 | low |

The distribution of pretest and posttest data on students 'critical thinking abilities was tested using the Kolmogorov-Smirnov test which further increased students' critical thinking abilities before and after learning statistically analyzed using paired samples test using SPSS 25.

## RESULTS AND DISCUSSION

Critical thinking is included in higher-order thinking skills. This statement is explained in a study by Massa (2014) which states that "Bloom and his colleagues are included in critical thinking in the educational approach. Their taxonomy for information processing skills, especially the three highest levels (analysis, synthesis, and evaluation) are often considered as representations of critical thinking. "According to Krathwohl (Lewy et al., 2009) that high-level critical thinking includes the process of analyzing (C4) and evaluating (C5). The cognitive process of analysis includes: analyzing information including dividing or structuring information to recognize patterns or relationships, identify/formulate questions, and recognize and distinguish the causes and effects of a problem. While the cognitive process of evaluating includes: providing an assessment of solutions, ideas, and methodologies using suitable criteria or existing standards to ascertain the value of effectiveness or benefits, make hypotheses, criticize, and test, and accept or reject a statement based on criteria that have been set.

The pretest and posttest students' critical thinking abilities tests refer to 5 indicators of critical thinking, namely formulating problems, planning problem-solving strategies, making decisions, analyzing problems, and evaluating decisions. Based on the research conducted, students' critical thinking abilities before using the Islamic integration thematic module are divided into two categories, namely, less critical 43% and 57% uncritical. The results of students' critical thinking abilities based on the pretest scores are presented in Table 4 and Figure 4.

Table 4. Results of students' critical thinking ability (Pretest)

| No | Category | Number of Students | Percentage (%) |
|---|---|---|---|
| 1. | Less critical | 9 | 43 |
| 2. | Uncritical | 12 | 57 |

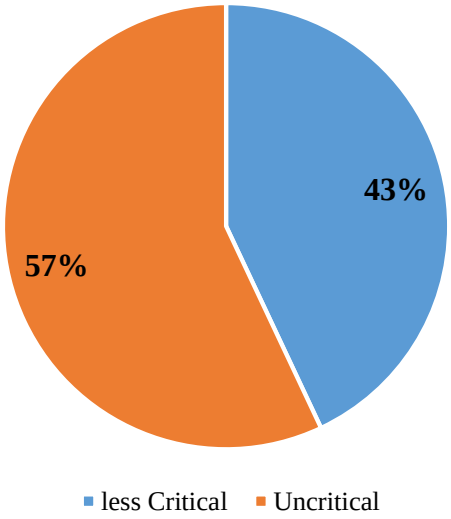



Figure 4. Students' critical thinking ability results (pretest)

Table 4 and Figure 4 show that students' initial critical thinking abilities are still lacking. It is shown by a lack of learning activities that involve students playing a direct role so that students' critical thinking abilities are not honed. Leicester (2010) states, involving students in learning activities can support the development of students' critical thinking abilities. The results of the post-test of the ability to think critically after using the thematic module are divided into four categories, namely very critical 48%; critical 24%; quite critical 19%; and less critical 10%. The results of students' critical thinking abilities can be seen in Table 5 and Figure 5.

Table 5. Results of students' critical thinking ability (Posttest)

| No | Category | Number of Students | Percentage (%) |
|---|---|---|---|
| 1. | Very critical | 10 | 48 |
| 2. | Critical | 5 | 24 |
| 3. | Critical enough | 4 | 19 |
| 4. | Less critical | 2 | 10 |

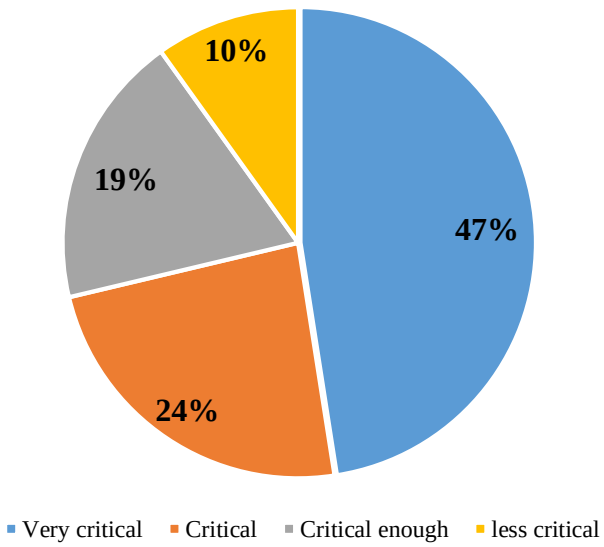



Figure 5. The results of critical thinking ability (Posttest)

The results of critical thinking abilities shown in Table 5 and Figure 5 were obtained from the analysis of critical thinking abilities indicators namely formulating problems, planning problem-solving strategies, making decisions, analyzing problems, and evaluating decisions. Based on the results of the study note that students' critical thinking abilities increase after learning using Islamic thematic integration modules. The results of the analysis of each indicator of students' critical thinking abilities show that the average score of students' critical thinking abilities in uncritical categories (X <43,75), while the average post-test scores of students' critical thinking abilities are categorised as critical (X> 71.50), with an n-gain of 0.5 with moderate criteria as presented in Table 6.

Table 6. The average score of students' critical thinking abilities

| No | Indicator | Score | | n-gain | Category |
|---|---|---|---|---|---|
| | | Pre Test | Post Test | | |
| 1. | Formulate the problem | 43 | 88 | 0.8 | High |
| 2. | Plan problem solving strategies | 45 | 81 | 0.7 | Medium |
| 3. | Make decision | 45 | 80 | 0.6 | Medium |
| 4. | Analyze the problem | 36 | 64 | 0.4 | Medium |
| 5. | Make conclusions | 30 | 45 | 0.2 | Low |
| Average | | | | 0.5 | Medium |

Increased students' critical thinking abilities for each indicator are also presented in Figure 6 which shows that the indicators formulating the problem experienced the highest increase after learning using Islamic thematic integration modules.

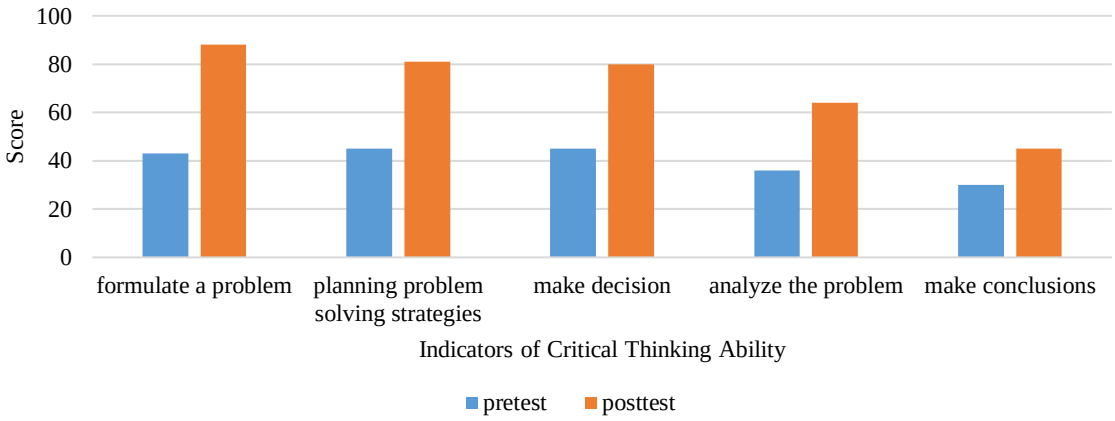



Figure 6. Average value per indicator of critical thinking ability

The pretest and posttest results of students 'critical thinking abilities were tested by one sample of Kolmogorov-Smirnov to determine the distribution of these data. The results of the distribution tests of students' critical thinking abilities are presented in Table 7.

Table 7. Normality of students' critical thinking abilities data.

| Item | Tes | N | Critical Thinking Ability | | | |
|---|---|---|---|---|---|---|
| | | | Mean | SD | p | Normality |
| Pretest-posttest | pre-test | 21 | 58.05 | 10.05 | 0.094 | yes |
| | post-test | 21 | 78.86 | 6.65 | 0.053 | yes |

Based on the results of the data distribution test as shown in Table 7, it can be seen that the pretest and posttest data of students 'critical thinking abilities are normally distributed (p> 0.05) so that the significance of the increase in students' critical thinking abilities is tested using paired test samples as presented in Table 8.

Table 8. The critical thinking abilities paired samples test results.

| Scores | N | Mean | SD | t | df | p |
|---|---|---|---|---|---|---|
| Pre-test | 21 | 58.05 | 8.959 | 10.644 | 20 | 0.000 |
| Post-test | | 78.86 | | | | |

Table 8 shows that the t-value is 10.644 with t-table of 2.085 ($t_{count} > t_{table}$). The significance value of increasing students 'critical thinking abilities after learning using Islamic thematic integration modules also shows a significant impact ($p < 0.05$) so that it can be stated that the Islamic integration in the thematic modules is effective in increasing students' critical thinking abilities on the tested theme. In line with the results of the study, Khoiri, et al (2017) stated that learning based on the integration of Islamic science can improve learning outcomes, activeness, and creativity of students in the learning process. In addition, research conducted by Aji (2014) showed student learning outcomes improved. Islamic aspect integration in learning improves the learning outcomes because learning is presented concretely by containing religious values written in the verses of the Qur'an. Learning will take place meaningful, contextual and loaded by values that develop in students' lives. Ausubel (1963) states that meaningful learning is a process of linking new information to relevant concepts contained in a cognitive structure. Facts, concepts, and generalizations are the cognitive structure that has been learned and remembered by students.

It is worth noting that the thematic integrated module of Islam was arranged systematically as such easily understood by students. Such arrangement was adjusted according to their age and level of knowledge which in turns helps the students' learn independently in minimal guidance. The use of Islamic-based integration modules guides students to learn independently and provide concrete experience in problem-solving case so that they practice higher-order thinking skills including critical thinking abilities and help students develop scientifically correct concepts. This study shows an increase in the results of critical thinking assessments as demonstrated from the increase in the data of students' critical thinking. This active student behaviour is able to influence the level of critical thinking abilities, this is in line with the opinion of Forawi (2012) which states that with the emphasis and practice of critical thinking abilities either through training or the existence of new learning resources, it will make students become trained to improve critical thinking abilities. This opinion is in line with the results of the study, which showed significant enhancement in the students' critical thinking abilities ($p < 0.05$).

Based on Table 6, of the five indicators of critical thinking ability of students who obtained the highest average posttest score is an indicator of formulating a problem of 88 with an n-gain score of 0.8. The findings suggest that there is an increase in students' critical thinking abilities by implementing the Islamic integration thematic module. This results suggest that students can understand the questions and write down information or facts that are contained in the form of sentence questions. Students learn to think critically gradually through practising habits in the form of formulating problems and answering questions that require explanation (Leicester, 2010). According to Rahmawati et al (2016), the skill of formulating a problem is very important so that students know what steps will be taken to resolve the problem. The question words in the form of what, why, and how are the basic steps in conducting research and encouraging students to analyze critically.

The next indicator of thinking skills is planning a strategy for problem-solving. The indicator for indicator obtained an average posttest score of 81 with a medium n-gain category. Indicators planning problem-solving strategies in critical thinking abilities means planning solutions to problems through the application of concepts students have. Critical students tend to be more active in efforts to solve problems, including the activeness of asking questions to obtain clear information, the seriousness in working on existing problems in order to obtain a logical solution, the courage to express opinions and ideas they have to criticize solutions that he thinks are rational and are able to attract the conclusion of the

existing mathematical settlement (Indraningtias & Wijaya, 2017). The thematic modules for the integration of Islam used in this study also emphasize the active process of students in inquiry activities. Prayogi et al. (2017) states that the emphasis of learning on the active process of students in inquiry activities can foster critical thinking abilities.

Indicator of analyze the problem and decision making obtained an average posttest score of 64 and 80 with a moderate n-gain category. The problem analysis activity aims to guide students to think more broadly, provide a challenge, test mathematical abilities rather than procedural, and enrich learning resources (Azizah, 2018). In addition, critical thinking activities provide opportunities for students to evaluate their own thoughts and change thinking behaviour to apply the knowledge they already have (Alghifri & Ismail, 2014). This finding is pupported by Anderson Krathwohl (2001) that stated students will be used to think critically both in decision making and problem-solving relating to analyzing, evaluating, and creating.

The indicator of "makes a conclusion" obtaines a posttest score of 45 with a low n-gain category. The result shows that students can express ideas supported with the right reasons in supporting the conclusions made and consider relevant information (Facione, 2011). In this case, it can be said that students are still not able to use relevant information to solve the problem provided so that students cannot make an appropriate alternative resolution. As a result, students cannot draw conclusions from these problems and show that students' critical thinking abilities, especially in the aspect of making conclusions, are still lacking.

The overall results indicate the effectiveness of Islamic value integration in increasing students 'critical thinking abilities, which also supported by findings of Suarsana (2013). This increase is due to the learning activities contained in the thematic integration module providing opportunities in students to learn to analyze and express so that students' critical thinking abilities can be developed. In line with this statement Susanto (2015) states that efforts to form optimal student critical thinking abilities require interactive learning. The teacher acts as a mediator, facilitator, and motivator; while students are seen as the thinkers, not someone who is taught.

## CONCLUSION

This research has achieved the formulated goal of improving students' critical thinking abilities using the Islamic thematic integration module based on the effectiveness test and the impact of the Islamic integration thematic module used. It can be concluded that the use of thematic effective integration thematic modules have a significant impact on improving students' critical thinking abilities at MI Salafiyah Kutukan Blora.

## RECOMMENDATION

Since the curriculum applied is the 2013 curriculum, it is recommended that teaching materials used to cover all four core competencies are in one learning. Teachers in the learning process should be able to develop teaching materials or modules in accordance with the spiritual aspects of students so that there is a balance between intellectual and spiritual through Islamic values in students.

## ACKNOWLEDGMENT

Thank you to the Ministry of Research, Technology and Higher Education of the Republic of Indonesia who has provided funding support in the completion of this study (Decree number: 7/E/KPT/2019).

## REFERENCES

Aji, R., H., S. (2014). Khazanah Sains dan Matematika dalam Islam. *SALAM: Jurnal Sosial dan Budaya Syar-i, 1*(1), 155-168. doi:https://doi.org/10.15408/sjsbs.v1i1.1534

Alghifri, A., S., R., & Ismail, H., N., B. (2014). The Effects of Integrating Creative and Critical Thinking on Schools Students' Thinking. *International Journal of Social Science and Humanity*, *4*(6), 518–525. DOI: https://doi.org/10.7763/IJSSH.2014.V4.410

Anderson, L., W., & Krathwohl, D., R. (2001). *Taxonomy for Learning, Teaching, and Assesing: A revision of Bloom's Taxonomy of Education Objectives*. New York: Addison Wesley Lonman Inc.

Angeli, C., & Valanides, N. (2009). Instructional effects on critical thinking: Performance on ill-defined issues. *Learning and Instruction*, 19(4), 322-334. Doi: https://doi.org/10.1016/j.learninstruc.2008.06.010

Arends, R. (2012). *Learning to Teach. Ninth Edition*. New York: McGraw-Hill.

Arifin, Z. (2016). *Evaluasi Pembelajaran.* Jakarta: PT.Remaja Rosda Karya.

Asy'ari, M., Ikhsan, M., & Muhali. (2019). The Effectiveness of Inquiry Learning Model in Improving Prospective Teachers' Metacognition Knowledge and Metacognition Awareness. International Journal of Instruction, 12(2), 455-470. Doi: https://doi.org/10.29333/iji.2019.12229a

Ausubel, D. P. (1963). *The Psychology of Meaningful Verbal Learning*. New York: Grune & Stratton Publishers.

Azizah, M., Sulianto, J., & Cintang, N. (2018). Analisis Keterampilan Berpikir Kritis Siswa Sekolah Dasar pada Pembelajaran Matematika Kurikulum 2013. *Jurnal Penelitian Pendidikan*, *35*(1), 61-70. doi: 10.15294/jpp.v35i1.13529

Conklin, W. (2012). *Higher-Order Thinking Skills to Develop 21st Century Learners*. Shell Educational Publishing, Inc.

Costa, A. L. (1985). *Developing Minds : A Resource Book for Teaching Thinking*. Virginia: ASCD Publication.

Dewey, J. (1933). How We Think: A Restatement of the Relation of Reflective Thinking to the Educative Process. DC Heath.

Ennis, R. H. (1991). *Critical thinking: A streamlined conception. Teaching Philosophy*. *14*(1), 5–24. Retrieved from: https://education.illinois.edu/docs/default-source/faculty-documents/robert-ennis/ennisstreamlinedconception_002.pdf?sfvrsn=91b61288_0

Ennis, R. H. (2011). The Nature of Critical Thinking: An Outline of Critical Thinking Dispositions and Abilities. University of Illinois, 1-8. Retrieved from: https://education.illinois.edu/docs/default-source/faculty-documents/robert-ennis/thenatureofcriticalthinking_51711_000.pdf

Facione, P. A. (2011). *Critical Thinking: What it is and why it Counts*. Insight Assessment. Retrieved from: https://www.student.uwa.edu.au/__data/assets/pdf_file/0003/1922502/Critical-Thinking-What-it-is-and-why-it-counts.pdf

Faizah, S., N. (2018). Pengembangan Modul Tematik Berbasis Integrasi Islam dan Sains pada Tema Energi dan Perubahannya. Pada *Seminar Nasional Pendidikan* (pp. 207-211). Lamongan, Indonesia: Universitas Islam Lamonagan. Retrieved from: http://semnas.unisla.ac.id/index.php/PDD/article/view/126

Fisher, A. (2008). *Berpikir Kritis Sebuah Pengantar*. Jakarta: Erlangga.

Fitriani, H., Asy'ari, M., Zubaidah, S., & Mahanal, S. (2019). Exploring the Prospective Teachers' Critical Thinking and Critical Analysis Skills. *Jurnal Pendidikan IPA Indonesia*, *8*(3), 379-390. doi:https://doi.org/10.15294/jpii.v8i3.19434

Forawi, S., A. (2012). Perceptions on Critical Thinking Attributes of Science Education Standards. In *International Conference on Education and Management Innovation*. (pp. 214-217). Singapore: IACSIT Press.

Goodwin, J. (2012). SAGE Biographical Research. LA, US: SAGE Publications.

Hake, R. R. (1999). *Analyzing Change/Gain Scores*. AREA-D: American Education.

Hasruddin. (2009). Memaksimalkan kemampuan berpikir kritis melalui pendekatan kontekstual. *Tabularasa PPS UNIMED*, *6*(1), 48-60. Retrieved from: http://digilib.unimed.ac.id/702/1/Memaksimalkan%20kemampuan%20berpikir%20kritis%20melalui%20pendekatan%20kontekstual.pdf

Hastuti, S. (2009). *Peningkatan Kemampuan Berpikir Kritis Matematis Peserta didik Smp Melalui Pembelajaran Berbasis Masalah*. Materi disampaikan dalam seminar Nasional Matematika dan Pendidikan Matematika Jurusan Pendidikan Matematika FMIPA UNY tanggal 5 Desember 2009 di Universitas Negeri Yogyakarta.

Helpern, R. P. (2013). *Critical tinking workshop for Helping Our Students Become Better Thinker*. Retrieved from: https://louisville.edu/ideastoaction/-/files/featured/halpern/critical-thinking.pdf

Idi, A. (2014). *Pengembangan Kurikulum Teori dan Praktik*. Jakarta: PT. Grafindo Persada.

Indraningtias, D., A., & Wijaya, A. (2017). Pengembangan Perangkat Pembelajaran Berbasis Matematika Realistik Materi Bangun Ruang Sisi Datar Berorientasi Pada Kemampuan Berpikir Kritis Siswa Kelas Viii Smp. *Jurnal Pendidikan Matematika*, *6*(5), 24–36. Retrieved from: http://journal.student.uny.ac.id/ojs/index.php/pmath/article/download/7796/7423

Khairiyah, U. (2017). Melatihkan Life Skills Melalui Pembelajaran IPA dengan Pendekatan Scientific untuk Meningkatkan Hasil Belajar Siswa. *Jurnal At-Thulab*, *1*(1), 33–42. Retrieved from: http://journal.unisla.ac.id/pdf/118112017/4.%20Ummu%20Khairiyah,%20Melatihkan%20Life%20Skills%20Melalui%20Pembelajaran%20IPA%20dengan%20Pendekatan%20Scientific.pdf

Khoiri, A., Agussuryani, Q., & Hartini, P. (2017). Penumbuhan Karakter Islami melalui Pembelajaran Fisika Berbasis Integrasi Sains-Islam. *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, *2*(1), 19-31. DOI: https://doi.org/10.24042/tadris.v2i1.1735

Kunandar. (2008). *Guru Profesional Implementasi Kurikulum Tingkat Satuan Pendidikan (KTSP) dan Sukses dalam Sertifikasi Guru*. Jakarta: Rajawali Press.

Leen, C., C., Hong, H., Kwan, F., N., H., Ying, T., W. (2014). *Creative and Critical Thinking in Singapore Schools.* Nanyang: Nanyang Technological University.

Leicester, M. (2010). *Critical Thinking Across The Curriculum: Developing Critical Thinking Skills, Literacy And Philosophy In The Primary Classroom*. England: Open University Press.

Lewy, L., Zulkardi, Z., & Aisyah, N. (2013). Pengembangan soal untuk mengukur kemampuan berpikir tingkat tinggi pokok bahasan barisan dan deret bilangan di kelas ix akselerasi smp xaverius maria palembang. *Jurnal Pendidikan Matematika, 3*(2), 14-28. doi:https://doi.org/10.22342/jpm.3.2.326.

Massa, S. (2014). The Development of Critical Thinking in Primary School: The Role of Teachers' Beliefs. in *Procedia-Social and Behavioral Sciences.* (pp. 387-392). doi: https://doi.org/10.1016/j.sbspro.2014.05.068

Muslich, M. (2010). *Text Book Writing*. Jogjakarta: Ar-Ruzz Media Group.

Nawawi, S., & Wijayanti, T., F. (2018). Pengembangan asesmen biologi berbasis keterampilan berpikir kritis terintegrasi nilai Islam. *Jurnal Inovasi Pendidikan IPA, 4*(2), 136-148. doi:https://doi.org/10.21831/jipi.v4i2.21265

Paul, R., & Elder, L. (2019). The Miniature Guide To Critical Thinking Concepts & Tools. Rowman & Littlefield.

Prayogi, S., Muhali, M., Verawati, N. N. S. P., & Asy'ari, M. (2017). Pengembangan model pembelajaran aktif berbasis inkuiri untuk meningkatkan keterampilan berpikir kritis mahasiswa calon guru. *Jurnal Pengajaran MIPA*, *21*(2), 148-153.

Prayogi, S., Yuanita, L., & Wasis. (2018). Critical Inquiry Based Learning: A Model of Learning to Promote Critical Thinking Among Prospective Teachers of Physic. *Journal*

*of Turkish Science Education (TUSED)*, *15*(1), 43-56. Doi: https://doi.org/10.12973/tused.10220a

Rahmawati, I., Hidayat, A., & Rahayu, S. (2016). Analisis Keterampilan Berpikir Kritis Siswa SMP Pada Materi Gaya Dan Penerapannya. Pada *Prosiding Semnas IPA Pascasarjana UM*. (pp. 1112–1119). Malang: Universitas Negeri Malang.

Setyowati, A. (2011). Implementasi Pendekatan Konflik Kognitif dalam Pembelajaran Fisika untuk Menumbuhkan Kemampuan Berpikir Kritis Siswa Kelas VII. *Jurnal Pendidikan Fisika Indonesia*, *7*(2), 89–96. DOI: https://doi.org/10.15294/jpfi.v7i2.1078

Suarsana, I. (2013). Pengembangan e-modul berorientasi pemecahan masalah untuk meningkatkan keterampilan berpikir kritis mahasiswa. *JPI (Jurnal Pendidikan Indonesia)*, *2*(2), 264-275. doi:http://dx.doi.org/10.23887/jpi-undiksha.v2i2.2171

Sugiyono. (2009). *Metode Penelitian Kuantitatif dan R&D*. Bandung: CV Alfabeta.

Susanto, A. (2015). *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Prenadamedia Group.

Trilling, B., & Fadel, C. (2009). *21st Century skills: Learning for life in our times*. USA: Jossey-Bass.

Vargas-Alfonso, D. (2015). Evidence of Critical Thinking in High School Humanities Classrooms. *Gist-Education and Learning Research Journal*, (11), 26-44. DOI: https://doi.org/10.26817/16925777.281

Wahyudi, W., Verawati, N. N. S. P., Ayub, S., & Prayogi, S. (2019). The Effect of Scientific Creativity in Inquiry Learning to Promote Critical Thinking Ability of Prospective Teachers. *International Journal of Emerging Technologies in Learning (iJET)*, *14*(14), 122-131. doi:http://dx.doi.org/10.3991/ijet.v14i14.9532