

COMPUTATIONAL THINKING-BASED FIQH LEARNING STRATEGIES IN PESANTREN

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Abstrak

Tujuan penelitian ini adalah untuk mengetahui strategi pembelajaran fiqh berbasis *Computational Thinking* di pondok pesantren. Penelitian ini menggunakan kualitatif deskriptif, yang termasuk kedalam jenis penelitian lapangan (*field Research*). Sumber data yang digunakan berupa data primer dan sekunder. Pengumpulan data dilaksanakan dengan wawancara, observasi, dan dokumentasi. Data kemudian dicek keabsahannya melalui triangulasi. Setelah data terkumpul maka dianalisis dengan cara reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian menunjukkan bahwa strategi pembelajaran fiqh berbasis *Computational Thinking* dalam pemahaman materi fikih santri diajarkan dengan cara mengimplementasi indikator-indikatornya seperti dekomposisi, pengenalan pola, abstraksi, dan algoritma sebagai alat bantu pemahaman fikih santri, dan praktik secara langsung bagi santri. Strategi pembelajaran fiqh berbasis *Computational Thinking* bisa meningkatkan pemahaman santri terhadap materi menjadi lebih mendalam. Penelitian ini bisa menjadi khazanah baru dan rujukan dalam menyelenggarakan pembelajaran di pesantren berbasis *Computational Thinking*.

Kata kunci: Strategi Pembelajaran, Fiqh, Computational Thinking

Abstract

The purpose of this research is to find out the learning strategy of fiqh based on Computational Thinking in Islamic boarding schools. This research uses descriptive qualitative methods, which are included in the type of field research. The data sources used are primary and secondary data. Data collection was carried out through interviews, observations, and documentation. The data was then checked for validity through triangulation. After the data is collected, it is analyzed by data reduction, presentation, and conclusion drawing. The results showed that the Computational Thinking-based fiqh learning strategy in understanding santri fiqh material was taught by implementing indicators such as decomposition, pattern recognition, abstraction, and algorithm as a tool for understanding santri fiqh and direct practice for santri. Computational Thinking-based fiqh learning strategies can increase students' understanding of the material to be more in-depth. This research can be a new treasure and reference in organizing learning in Computational Thinking-based pesantren.

Keywords: Learning Strategy, Fiqh, Computational Thinking

A. INTRODUCTION

In some historical literature, pesantren is an Indonesian Islamic education established before Indonesia's independence. The type of education in pesantren is still traditional, especially in learning characterized by Islamic religious knowledge. The characteristic of thick religious learning manifests the enthusiasm of the previous community who wanted to understand religion intensively and realize the expansion of Islam to all corners. Preaching religion with peace (Ammar et al., 2021).

The glory of an educational institution is not easy to achieve. Various problems, such as the unpreparedness of educational institutions in facing the times, the lack of integration of modern technology into traditional curricula, and the resistance to adopting innovative teaching strategies, have hindered the progress of education in adapting to rapid global changes. This is the primary factor hindering adaptation in educational management. So, when current technological advances are not accompanied by an increase in the quality of pesantren, it will result in the decline of education. Examples of the decline of education in pesantren are the perception of the dichotomy of religious and general sciences, the lack of professionalism of teachers/ustadz, the closedness of some pesantren from technological advances, and the assumption that the pesantren environment is still a slum. (Fadli & Syafi'i, 2021).

However, the various problems that arise do not dim the existence of pesantren to this day. Multiple kinds of regeneration are faced in the form of a decline phase to the peak of glory. The most basic influence in the weakness or decline phase is the incompetence of the leadership relay in the institution. In addition, the attractiveness of pesantren is one of the influences on the success or failure of an educational institution. In addition, the ability to survive in facing the challenges of the times will provide evidence of the success of the bureaucracy run by an educational institution. So, it cannot be denied that the success of Islamic boarding schools also depends on how a kyai manages the reforms that occur today. One of the updates that is the main concentration is on teaching and learning, where both processes affect the intellectual development of students. Therefore, one of the best supports is providing structured and intensive religious material through Islamic religious activities and learning. (Krisdiyanto et al., 2019).

Based on one of the explanations in the form of encouragement described in the previous explanation, various supporting processes emerge as a means of strengthening actualization in students; what is needed now is an adjustment to the times. One of them is increasing the professionalism of a teacher/ustadz because of the importance of a teacher having competence in the form of using appropriate teaching methods and being in accordance with the times. To achieve the planned learning strategy, the learning process in pesantren occurs face-to-face with various techniques such as classical methods, sorogan, bandongan, discussion, memorization, questions and answers, and lectures (Adib, 2021).

The learning process is still traditional because the teaching method is still old-fashioned/conventional, such as the method of listening to the teacher speak, also known as the lecture method; this style of learning is still widely used, especially in salaf pesantren (Arifiah, 2021). Judging from the existing reality, if there is no adjustment to the era, it will have an impact on the slow integration of science and adjustment to the digital era, the ease of being

dragged down by the flow of the times, and the lack of knowledge about contemporary Islamic education that is growing until now (Oktaria et al., 2022).

Not only that, the problem that arises in some Islamic boarding schools is that they do not have a fixed curriculum document archive or the guidelines are still changing, so the curriculum is still implied (Hidden Curriculum). The objectives are still in the form of directions from the previous kyai/elder (Prayoga et al., 2020). So, a pesantren institution must have preparations to make guidelines to deal with the times and the rapid advancement of information technology. If not balanced with careful preparation, fast changes will only cause new problems that are constantly repeated with the same mistakes without the right solution. In addition to traditional and monotonous teaching, institutional actors will also experience other challenges. The challenge is in the form of moral degradation due to globalization, and it is feared that this impact will lead to an attitude of belief in religion only in the form of a spiritual journey rather than being a guide to human life. (Husna, 2021). In addition, low digital literacy will result in receiving information that is less relevant to fake news (hoaxes). It becomes easy to provoke the community, which means it will also impact the mindset of teachers and students/students at this time (Muflihini, 2020).

To navigate changes and thrive in the era of digitalization, it is essential to develop the skills required to adapt to 21st-century educational advancements. (Noviyanti et al., 2023). The abilities that must be possessed are the creation of quality creativity, increased innovation in service products, up-to-date work processes, renewal of ways of thinking, individualist mental changes to collaborative and communicative, and open-minded thinking. Then, the Center for Curriculum Redesign (CCR) emerged to provide references to the 21st century, with four-dimensional education: education, skills/abilities, character and metacognition (Ansori, 2020).

The ability needed to support change and competition in the digitalization era, especially in the context of learning in pesantren, one of which is a Computational Thinking-based Learning strategy often known as computational thinking. This framework is a basic skill a person must have to answer problems in the 21st century (Maharani et al., 2020). The basic skill in computational thinking is to solve complex problems into simple ones in an efficient, effective, and optimal way with the goal of a solution based on the specified steps (Amalia & Husna, 2022). The implementation of Computational Thinking is commonly used in formal schools, where there is already a curriculum and structured evaluation to support the education process. Although it has been running on some learning materials in formal schools, some teachers and schools do not recognize a framework based on Computational Thinking (Mauliani, 2020).

One of the efforts made in several educational institutions today is integrating the concept of computational thinking in schools and madrasah. Computational Thinking is introduced through question pieces of training and competitions held by the Indonesian Bebras Bureau for all levels of education in Indonesia. This framework is not only introduced to schools/madrasahs but also to boarding school educational institutions. One of the introductions was made in Salatiga. It is not impossible for Computational Thinking to be introduced to these institutions because the concept of computational thinking can be integrated into general and even religious subjects. After all, the benefits are in the form of high-level thinking training and how to deal with this era of digitalization (Salehudin, 2023).

Computational thinking (CT) is a problem-solving approach that involves logical, systematic, and algorithmic thinking. In the context of fiqh learning in pesantren, CT is important because it provides a framework for santri to understand and analyze Islamic law in depth. Here are some reasons why CT is relevant in fiqh learning: 1) Analyze the problem systematically. Fiqh often deals with complex issues that require understanding the basic principles of Islamic law, such as ushul fiqh and fiqhiyyah rules. With CT, students can identify the main components of the problem, divide the problem into smaller parts (decomposition), and relate a particular case to a relevant principle or proposition; 2) Algorithm in law drawing. Determining law in fiqh often follows specific steps, for example, identifying the proposition (Qur'an, Hadith, Ijma', Qiyas), analysing the context, and applying fiqhiyyah rules. CT helps students understand how this process can be used like an algorithm, i.e. explicit and sequential steps.

The author is interested in studying the Computational Thinking-based fiqh learning strategy implemented at Pondok Pesantren Salafiyah Pulutan Salatiga. This is the uniqueness and novelty of this research. Pondok Pesantren Salafiyah Pulutan Salatiga is a conventional boarding school organizing learning, but this traditional learning is then integrated with a Computational Thinking-based framework.

B. METHODS

This research uses a descriptive qualitative approach to describe how fiqh learning strategies are implemented in Islamic boarding schools. This research is a type of field research (field research) located in Salafiyah Salatiga Islamic Boarding School. Data collection techniques used observation, interviews, and documentation. The author directly observed fiqh learning activities based on computational thinking strategy. The author also interviewed teachers (ustadz) who used computational thinking strategies in fiqh learning. The author uses documentation to obtain data in fiqh lesson planning based on computational thinking strategy. Data analysis techniques are carried out in three stages: data reduction, data presentation, and conclusion drawing. Data validity techniques using triangulation techniques and source triangulation.

C. RESULTS AND DISCUSSION

Pondok Pesantren Salafiyah Pulutan Salafiyah Pulutan is located at Pulutan No. 164, Pulutan, Sidorejo sub-district, Salatiga city, Central Java. Salafiyah Islamic Boarding School is a traditional Islamic boarding school that still upholds the typical traditions of salaf pesantren, namely using a typical pesantren learning system such as bandongan and sorogan, pegon, and yellow classical books. However, one teacher (ustadz) uses a unique learning strategy when teaching fiqh material, namely Ustadz Munajat, who uses computational thinking as the basis for fiqh learning. The following is the process of implementing fiqh learning based on Computational Thinking.

1. Planning

Unlike in formal educational institutions that require learning planning documents in the form of lesson plans (RPP) or teaching modules, (ustadz) fiqh teachers in Pondok Pesantren

Salafiyah are not required to make learning planning documents such as lesson plans (RPP) or teaching modules. In learning fiqh based on computational thinking, teachers (ustadz) do not make lesson planning documents because there is no demand. However, because Ustadz Munajat is a Tutor or trainer of the Bebras Bureau tasked with campaigning for the concept of Computational Thinking, there is no need to make special preparations because he is already an expert in Computational Thinking.

2. Implementation

Learning fiqh at Pondok Pesantren Salafiyah Islamic is generally taught in other Islamic boarding schools. The fiqh book taught is Mabadi Al-Fiqhiyah by Imam Abu Abdillah Muhammad bin Idris bin Al-Abbas, a great scholar from Yemen who contributed a lot to the development of Islamic teachings through his knowledge and works. Mabadi Al-Fiqhiyah is a fiqh book that is very popular among pesantren. The majority of pesantren in Indonesia teach the book. The media used in learning fiqh uses conventional media such as the blackboard. The methods used are lectures and discussions. However, in teaching the book of Mabadi Al-Fiqhiyah, the ustadz (teacher) uses Computational Thinking as the foundation of learning.

Computational thinking is a tool that helps people think in a structured, effective, efficient manner quickly and optimally when finding problems. So it is relevant when associated with optimization in understanding fiqh, ushul fiqh and fiqh rules. Because fiqh has conditions and pillars when running it, then using it must be coherent, not only in worship and amaliyah; deciding a law must consider everything to optimize the solution that will be obtained. So that with the use of this concept, students will be able to solve problems optimally.

Computational thinking has a broader meaning in computer science/technology and as a method of thinking, namely, a framework that describes a series of critical thinking skills and solves a problem. Thus, teaching skills to learners to be skilled in the education process (Kong & Abelson, 2022:1-2). In carrying out the learning process based on Computational Thinking, we must first understand the concept that will be used. The concept is a series of steps, namely, Decomposition (the ability to break down problems into sub-problems), Pattern Recognition (the ability to find harmony and contrast in data), abstraction (extracting unnecessary details and focusing on those needed to describe ideas or concepts globally), and Algorithms (the ability to create repetitive procedures or improve rules that previously had discrepancies so that they were evaluated and the procedures could solve specific problems). (Marfuah, 2022).

Computational Thinking-based fiqh learning strategy at Pondok Pesantren Salafiyah is taught traditionally. An example of the fiqh learning process of zakat material. Here is the application of computational thinking to solve the problem of distributing zakat fitrah based on the fiqh rule: 'The policy of the leader over his people is carried out based on the benefit'. In the distribution of zakat fitrah, there are problems such as a) Uneven distribution; b) Some mustahik receive too much, while others do not get it; c) Inaccuracy of Target: Some zakat recipients are not among the eight asnaf; d) Non-transparency: The distribution process often raises suspicion due to the lack of clear reports. The leader wants to improve the zakat fitrah distribution system to make it more fair, right on target, and bring benefits. Steps to Implement Computational Thinking:

First, Decomposition: Dividing the Problem into Small Parts. The main problem is broken down into Mustahik Identification: a) How can mustahik data be ensured in accordance with the eight asnaf? b) Zakat Collection: Is the amount of Zakat collected sufficient? c) Distribution Process: How do we distribute zakat efficiently and fairly? d) Transparency: How can we ensure the distribution of zakat is monitored and reported?

Second, Pattern Recognition: Looking for Patterns in Similar Cases: a) Traditional Management: Study traditional zakat distribution patterns, such as distribution at local mosques; b) Other Social Programmes: Analyze the distribution of social assistance by the government or other institutions that successfully reach a wide range of people; c) Principle of Beneficence: Identifying how distribution patterns can prioritize the most needy groups (masalah).

Third, Abstraction: Summarising the Core of the Problem. Ignore technical details and focus on fundamental questions: a) Who is entitled to receive zakat fitrah (mustahik)? b) How can we ensure zakat fitrah is distributed evenly without overlapping? c) How can the community be involved to maintain transparency?

Fourth, Algorithm: Designing a Step-Based Solution. Here are the solution steps: a) Mustahik data collection: Leaders work with village officials to collect data on mustahiks based on the eight asnaf criteria; b) Data is integrated into a simple digital system (could be a spreadsheet or app); c) Distribution Zones: The village is divided into several distribution zones to ensure that zakat does not accumulate in one area. A local zakat committee coordinates each zone; d) Establishment of Transparency Team: An independent team is formed to record the amount of zakat collected and distribute it with an open report to the community; e) Priority in Allocating Zakat: When the amount of zakat is limited, priority should be given to those most in need, such as the poor, the destitute, and zakat administrators (amil zakat); f) Distribution is made in the form of necessities so that the basic needs of the community are met; g) Evaluation and Improvement: After distribution, an evaluation is conducted to identify problems and develop an improvement plan for the following year. So, in teaching fiqh material, the teacher (ustadz) still uses the usual method implemented in traditional pesantren, where the teacher (ustadz) reads the text in the yellow book and then explains the meaning of the text read. However, in computational thinking, the teacher (ustadz) invites students to practice thinking, believing in computational thinking (decomposition, pattern recognition, abstraction, and algorithms).

3. Implications for Santri Understanding

With the fiqh learning strategy based on computational thinking, students can understand the distribution of zakat fitrah in-depth. In addition, the students practice thinking systematically to find solutions to problems in the distribution of zakat fitrah, which is based on computational thinking. Computational thinking does not just make students understand the material. Still, it provides students with a set of abilities to solve problems that arise in the community regarding issues, of course, with the ability to think as the concept of computational thinking.

To find out the understanding of santri, of course, based on each individual (internal) and the characteristics and abilities of students in receiving learning. Besides that, santri

understanding is also considered successful if the accompanying environment is conducive and the approach in the learning process occurs, and the approach can be in the form of (learning objectives, learning materials, exercises and repetitions and many more) (Samsudin, 2020). If it is related to the results of the study, the teacher provides a computational thinking-based learning strategy as an approach to learning that is more effective and efficient. Meanwhile, for santri, optimizing fiqh understanding with computational thinking with its use depends on the santri's ability to accept, awareness/motivation to learn to explore fiqh material and the learning environment as the most important support in understanding fiqh materials.

Computational Thinking (CT) can help students understand fiqh material because this approach involves logical, structured, and systematic thinking patterns. In the context of fiqh, which often contains complex rules of Islamic law and requires in-depth analysis, CT provides a powerful tool for understanding and applying them. Among the benefits of CT is that it helps analyze fiqh issues systematically. Fiqh often deals with complex problems, such as legal questions, in modern contexts, such as digital transactions or technology. With CT, students can break down the problem into smaller parts, such as identifying the postulates, fiqh rules, and the context of the issue. Example: In the issue of digital zakat, students can separate the issues of contracts, transfer techniques, and mustahik identification.

4. Supporting Factors

Implementing computational thinking in pesantren learning is certainly not easy. However, several factors make the application of Computational Thinking in fiqh learning at Pondok Pesantren Salafiyah be carried out smoothly, namely:

- a. Most students who live in the Pondok Pesantren Salafiyah are students, making it easier for teachers to provide knowledge and students at the university to receive learning from teachers, creating a conducive learning environment.
- b. Complete learning materials to understand fiqh with other supporting materials, such as ushul fiqh and fiqh rules, making it more optimal for students to understand fiqh.
- c. In the learning strategy based on computational thinking, students can understand more broadly and find references to the concept more easily through websites that are easily accessible.
- d. Guidance by professional teachers and experts in their fields is a facility that supports the process of understanding fiqh and the introduction of Computational Thinking-based learning strategies.

5. Inhibiting Factors

Although the application of Computational Thinking in fiqh learning at Pondok Pesantren Salafiyah can be carried out well, in its journey, the learning process based on Computational Thinking indeed encounters problems that can hinder the educational process, such as:

- a. Arabic books and some vocabulary that are difficult to interpret make it a challenge to optimize understanding of fiqh material.

- b. The students are not yet accustomed to recognizing and applying the concept/tool in the form of computational thinking to deal with problems in understanding fiqh in a structured manner.
- c. Students' awareness has not been maximized through exploration by reading deeper. When receiving to evaluate/review the discussion of fiqh with the concept of Computational Thinking.
- d. The intensity of learning and recognizing the concept of Computational Thinking in understanding fiqh material is still not maximized.

There have been many studies on applying computational thinking in learning, and the majority have found different benefits. Computational thinking increases students' interest and engagement in learning IPA material on leaf bone arrangement in class IV SD Kanisius Klepu (Wahyuni et al., 2023). *Computational thinking makes the student's learning process in mathematics at SD Muhammadiyah Siraman Wonosari more meaningful.* (Megawati et al., 2023). The application of computational thinking makes student activities at SD Kanisius Demangan Baru more developed in science learning (Setiawan et al., 2023). Computational Thinking can improve students' critical thinking skills in class X MIA 9 SMA Negeri 1 Surakarta (Kawuri et al., 2019). The position of this study, among other studies on Computational Thinking, is to strengthen and confirm that applying Computational Thinking has many benefits in learning. In this study, Computational Thinking can improve students' understanding of fiqh material. In addition, this study provides evidence that computational thinking can be applied in various educational institutions, not only in schools but also in pesantren.

This research can add new treasures about learning strategies in pesantren. So far, learning strategies in pesantren are still conventional and traditional. Integrating Computational Thinking in learning at Salafiyah Islamic Boarding School is undoubtedly a new thing that can be imitated by other pesantren to improve students' understanding of the material taught.

D. CONCLUSIONS

Computational Thinking-based fiqh learning strategies are implemented by integrating Computational Thinking into traditional and conventional learning procedures at Salafiyah Pulutan Salatiga Islamic Boarding School. Ustadz (teacher) teaches fiqh material with the usual method applied in pesantren, namely reading the text in the book, then explaining the meaning of the text read by integrating the concept of thinking in Computational Thinking, namely decomposition (the ability to break down problems into sub-problems), Pattern Recognition (the ability to find harmony and contrast in data), abstraction (the ability to extract unnecessary details and focus on those needed to describe ideas or concepts globally), and Algorithms (the ability to create repetitive procedures or improve rules that previously had discrepancies so that they were evaluated and the procedures could solve specific problems). Computational Thinking-based fiqh learning strategies can also increase students' understanding in more depth.

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