

## Building Technology-Based Islamic Education Learning: A Review of Learning Principles, Behaviorism, and Cognitivism

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**Abstract.** *Abstracts Technological developments in education have not been fully integrated optimally in Islamic Religious Education (PAI) learning, resulting in a gap between the needs of 21st-century learning and learning practices that are still predominantly teacher-centered. This condition encourages the need for an in-depth study of how learning principles and theories of behaviorism and cognitivism can be used as a basis for designing effective technology-based PAI learning. This study aims to analyze the integration of these learning theories as a basis for developing a more comprehensive technology-based PAI learning model. The study uses a library research approach by reviewing journals, books, and relevant research results, which are analyzed through content analysis techniques to identify conceptual patterns, similarities, and theoretical contributions. The results show that learning principles such as subsumption, progressive differentiation, and integrative reconciliation can strengthen the structure of digital PAI materials; behaviorism theory plays a role in designing technological features that are reinforcement and form religious habits; while cognitivism theory supports the development of digital media that facilitate information processing and meaningful learning. The conclusion of the study confirms that the integration of these three theoretical foundations can produce a technology-based PAI learning model that is more interactive, adaptive, and pedagogical. This study contributes to the development of a technology-based PAI conceptual framework and recommends empirical testing of the model's effectiveness through further research.*

**Keyword:** *Islamic Education Learning; Educational Technology; Learning Principles; Behaviorism; Cognitivism.*

### INTRODUCTION

The development of educational technology in the digital era has brought significant changes to the learning process, including in the field of Islamic Religious Education (PAI). Previously teacher-centered learning has now transformed into a more interactive, flexible, and digital-based approach. This change requires educators to understand how students learn and how learning theories can be utilized in designing effective learning technologies. In this context, behaviorism and

cognitive theories serve as important foundations for designing PAI learning strategies that adapt to technological developments. (Ariane Nafila, Dewi Utami, Dadan Mardani, 2023).(Ariane Nafila, Dewi Utami, Dadan Mardani, 2023).

The main problem in this research is how learning principles, behaviorist learning theory, and cognitive learning theory can be appropriately integrated in the development of Islamic Religious Education (PAI) learning technology. The lack of studies that comprehensively link learning theory with the design of Islamic Religious Education (PAI) learning technology is a key issue that requires further in-depth study. Various previous studies have shown that learning technology has been widely applied in various educational fields, but studies that explicitly link behaviorist and cognitive theories to the development of Islamic Religious Education (PAI) learning technology are still limited. Some studies only highlight the technical aspects of learning media, while others focus on only one learning theory without comprehensively integrating them. This gap indicates the need for research that integrates learning theory as a foundation in the design of Islamic Religious Education (PAI) learning technology.

This research offers a solution in the form of a model for developing Islamic Religious Education (PAI) learning technology based on learning principles, behaviorist and cognitive theories. This integration is expected to produce a systematic, measurable, and student-centered learning design, thereby enhancing the effectiveness of the Islamic Religious Education (PAI) learning process. The primary motivation for this research is to strengthen the theoretical foundation for developing Islamic Religious Education (PAI) learning technology so that it is not only oriented towards technical aspects but also considers the psychological and pedagogical aspects of students. Furthermore, the researcher is driven by the need for innovation in Islamic Religious Education (PAI) learning in the digital era, which demands a new, more scientific and relevant approach.

This study aims to analyze and integrate learning principles, behaviorism theory, and cognitive learning theory in the development of Islamic Religious Education (PAI) learning technology. The main objective of this study is to produce a concept or model for developing Islamic Religious Education (PAI) learning technology based on learning theory that can be used by educators and learning media developers. This study is expected to provide a theoretical contribution in the form of a deeper understanding of the relationship between learning theory and the development of Islamic Religious Education (PAI) learning technology. Practically, this study provides benefits for teachers, educational technology developers, and educational institutions in

designing Islamic Religious Education (PAI) learning that is more effective, engaging, and in line with current developments. Thus, this study can serve as a reference in developing technology-based Islamic Religious Education (PAI) learning strategies based on strong learning theory.

### METHOD

This research uses a qualitative approach with a library research approach. This approach was chosen because the research focuses on analyzing learning theories—behaviorism and cognitivism—and learning principles contextualized in the development of Islamic Religious Education (PAI) learning technology. This research does not involve field data collection, but relies on in-depth analysis of relevant literature sources, such as learning theory books, educational technology journals, digital-based PAI development studies, and scientific references discussing the integration of learning theories in learning design.

### FINDINGS

The findings of this study are based on a literature analysis of learning principles, behaviorism theory, and cognitive learning theory, and their relevance to the development of Islamic Religious Education (PAI) learning technology. The findings are summarized in Table 1 and interpreted to support the study's conclusions.

Tabel 1. Ringkasan Temuan Utama Penelitian

<b>Components</b>	<b>Core Findings</b>	<b>Implications for the Development of Islamic Religious Education Learning Technology</b>	
<b>Principles of Learning</b>	Subsumption, Progressive Consolidation, Reconciliation	Organizer, Differentiation, Integrative	Technology should enable the integration of new–old knowledge, the gradual presentation of material, and the reinforcement of understanding.
<b>Behaviorism Theory</b>	Learning is a change in behavior through stimulus-response and reinforcement; figures: Pavlov, Thorndike, Skinner		Digital platforms need to provide reward systems, repeated practice, monitoring of learning behavior, and direct feedback.

<b>Cognitive Theory</b>	Learning as an active mental process; Insight (Gestalt), cognitive development (Piaget), information processing	Technology should support meaningful learning, visualization, problem solving, exploration, and personalization of learning.
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### **A. Findings Regarding Learning Principles**

Literature analysis indicates that there are five main learning principles that play a role in student success: Subsumption, Organizer, Progressive Differentiation, Consolidation, and Integrative Reconciliation. These five principles emphasize that the learning process must be structured from the general to the specific, integrating new and prior knowledge, and reinforced through gradual mastery of the material. (Silvia Nur Faizah, 2017).

Interpretation of Findings: These findings indicate that Islamic Religious Education (PAI) learning technology needs to be designed to facilitate the hierarchical and logical organization of knowledge. This can be achieved through features such as content sequencing, tiered learning paths, and integration of material between units so that students do not receive information in isolation, but rather as a meaningful whole.

### **B. Findings on Behaviorism Learning Theory**

A literature review shows that behaviorist theory views learning as an observable change in behavior, occurring through stimulus-response relationships, and reinforced by reinforcement. Behaviorist figures such as Pavlov, Thorndike, and Skinner contributed to the understanding of habituation, practice, repetition, and reinforcement.

Some of the principles of behaviorism found in the literature include:

1. Law of Readiness, Law of Exercise, Law of Effect, dan Law of Attitude (Hergenhahn & Matthew).
2. The importance of positive and negative reinforcement in maintaining or eliminating behavior.
3. The role of the teacher as a stimulus controller and feedback provider. (Elvia baby shahbana, fiqh kautsar farizqqi, rachmat satria, 2020).

Interpretation of Findings:

This understanding of behaviorism suggests that Islamic Religious Education (PAI) learning technology needs to provide systems capable of consistently providing stimulus and reinforcement.

Examples include reward point features, automated quizzes with rapid feedback, learning behavior tracking, and reminder systems. In this way, technology can reinforce positive behaviors such as prayer routines, memorization, and other Islamic Religious Education (PAI) learning activities. (Mimi Jelita dkk, 2023).

### **C. findings on Cognitive Learning Theory**

Literature analysis shows that cognitive theory views learning as an active mental process involving perception, memory, understanding, and problem-solving. Gestalt theory emphasizes insight, while Piaget outlined four stages of cognitive development: sensorimotor, preoperational, concrete operational, and formal operational. Cognitive theory also emphasizes the importance of meaningful learning, life space, and transfer of learning (Yossita Wisman, 2020).

Interpretation of Findings:

These findings indicate that Islamic Religious Education (PAI) learning technology must provide a learning environment that supports exploration, meaningful learning, and problem-solving. Features such as digital simulations, verse visualizations, interactive concept maps, and case studies can help students build insight and connect PAI material to real-life situations. Furthermore, technology must be able to adapt the learning difficulty and model based on the learner's cognitive developmental stage.

Interpretation of Findings:

The overall interpretation of the findings suggests that the integration of learning principles, behaviorism, and cognitive theory can form a strong foundation for developing Islamic Religious Education (PAI) learning technology. Learning principles provide the structural direction of learning, behaviorism directs the reinforcement of behavior, while cognitivism provides a deep-understanding approach. The combination of the three emphasizes that Islamic Religious Education (PAI) learning technology must be:

1. Structured and hierarchical (according to learning principles)
2. Providing direct feedback and reinforcement (according to behaviorism)
3. Supports cognitive processes and problem solving (according to cognitivism)

These findings directly support the research objective, namely to formulate a comprehensive theoretical basis for developing Islamic Religious Education (PAI) learning technology (Sutarto, 2017).

## **DISCUSSION**

The research findings indicate that the learning principles—Subsumption, Organizer, Progressive Differentiation, Consolidation, and Integrative Reconciliation—have strong relevance in designing Islamic Religious Education (PAI) learning technology. These results align with Ausubel's theory of meaningful learning, which emphasizes that new knowledge can be understood more effectively if linked to existing cognitive structures. This is consistent with recent research showing that tiered learning paths in digital platforms can improve concept retention in religious and moral learning. These findings reinforce the principle that learning technology is not sufficient simply to provide material, but must also enable the gradual integration of knowledge. (Siti Ma'rifah Setiawati, 2018).

In the context of behaviorism, research findings confirm that stimulus, response, and reinforcement remain the fundamental principles in changing learning behavior, as evidenced by the experiments of Pavlov, Thorndike, and Skinner. Previous research in Islamic education also shows that digital reward systems can increase students' motivation to learn and practice religious practices. Therefore, the application of behaviorist theory through digital Islamic education platforms aligns with previous research showing that positive reinforcement strengthens religious habits (Mimi Jelita et al., 2023).

Meanwhile, cognitive learning theory, which emphasizes insight, mental organization, and information processing, aligns with research findings that Islamic Religious Education (PAI) learning technology must provide visualizations, simulations, and applicable contexts. These findings align with Gestalt theory and Piaget's cognitive development model, which states that students require a complete understanding structure before understanding details. Recent research in digital learning also shows that interactive features based on problem-based learning have been proven to improve understanding of abstract concepts, including in Islamic Religious Education (PAI) materials such as faith, morals, and jurisprudence (fiqh). (Leny Marinda, 2020).

Thus, this study demonstrates a strong alignment between the findings and classical learning theories and contemporary research, while also leading to an integrative model of technology-based PAI.

Several causal reasons can explain the alignment of research findings with learning theories: First, the learning principles were found to be relevant because Islamic Religious Education (PAI) contains a hierarchical conceptual structure: from core values (aqidah), to moral actualization (akhlak), to practice (fiqh). This structure aligns with the principles of progressive differentiation and

consolidation. Islamic Religious Education (PAI) material requires gradual mastery, so learning technology that organizes material hierarchically naturally supports students' learning process.

Second, behaviorism theory emerged as a strong foundation for digital learning because digital systems enable repetition (exercise), reinforcement, and instant response measurement. These elements are why the application of reward-based technology is so effective in Islamic Religious Education (PAI) learning, particularly in fostering habits of worship and memorization.

Third, cognitive theory is relevant because Islamic Religious Education (PAI) learning not only encourages behavioral change but also a deeper understanding of religious values. The processes of insight, visualization, and information processing are essential for abstract topics such as faith, destiny, and Islamic ethics. This explains why technology that enables concept mapping, simulations, and case studies is so effective in Islamic Religious Education (PAI).

Thus, the research findings have a strong causal basis, both in terms of the characteristics of the Islamic Religious Education material and the psychological characteristics of the students. This research makes several important contributions, namely:

1. Theoretical Contributions

This research integrates three basic learning theories—learning principles, behaviorism, and cognitivism—into a framework for developing Islamic education (PAI) learning technology. This integration provides a comprehensive theoretical model that has not been widely developed in the literature on religious education..

2. Practical Contribution

This research formulates a design guide for Islamic Religious Education (PAI) technology, encompassing a learning hierarchy, behavioral reinforcement systems, and cognitive development adjustments. This provides a foundation for platform developers, teachers, and Islamic educational institutions in creating effective and contextual learning media.

3. Methodological Contributions

This literature research enriches the theoretical study of Islamic Education learning with a multidisciplinary approach that combines educational psychology, learning theory, and Islamic pedagogy.

Although this research makes significant contributions, several limitations need to be acknowledged:

1. Data Source Limitations

The research used a literature review approach, thus not involving empirical data such as

observations, experiments, or interviews. This makes the findings conceptual rather than empirically applicable.

## 2. Limitations of Generalization

Because it relies on previous research and classical theories, generalization to specific school contexts or recent technological developments is limited.

## 3. Implementation Limitations

The research did not test the direct effectiveness of applying learning principles and theories in a specific PAI digital platform.

Based on the above limitations, several further research agendas can be developed:

### 1. Experimental Research

Testing the effectiveness of using digital reinforcement in increasing students' motivation for worship and memorization in schools.

### 2. Development of a Digital Islamic Education Learning Model

Developing and testing a prototype PAI platform that combines the principles of learning, behaviorism, and cognitivism.

### 3. Longitudinal Research

Analyzing the consistency of students' religious behavior after the implementation of reinforcement-based technology over the long term.

### 4. Developmental Stage Analysis

Testing the suitability of technology-based Islamic Education learning models with Piaget's cognitive development stages in the Indonesian context.

The recommendations in this study are:

1. Islamic Education teachers are encouraged to integrate reward systems and material visualization in digital learning.
2. Schools need to build digital learning infrastructure that enables hierarchical and interactive processes.
3. Developers of Islamic Education Platforms are advised to include learning path, automatic reinforcement, simulation, and concept map features.
4. Islamic Education Policy Makers can use the results of this research as a basis for formulating a technology-based Islamic Education curriculum.

## **CONCLUSION**

This study concludes that the integration of learning principles, behaviorism theory, and cognitive learning theory is an important foundation in developing effective and adaptive Islamic Religious Education (PAI) learning technology to meet the needs of students in the digital era. Learning principles such as Subsumption, Organizer, Progressive Differentiation, Consolidation, and Integrative Reconciliation provide structural direction in the development of Islamic Religious Education (PAI) learning materials, while behaviorism theory supports technology design that emphasizes behavioral reinforcement, providing direct feedback, and forming positive habits through stimulus-response and reinforcement systems. At the same time, cognitive theory plays a role in encouraging meaningful learning through visualization, problem-solving, organizing information, and adapting learning to students' cognitive developmental stages. The integration of these three frameworks produces a comprehensive understanding of how technology can be designed to facilitate more interactive, systematic, and relevant Islamic Religious Education (PAI) learning, addressing students' psychological characteristics. This research has a significant impact on the development of science by offering a conceptual model of technology-based Islamic Religious Education (PAI) learning based on learning theory, while providing practical implications for teachers, schools, and digital platform developers. Recommendations for further research include empirical testing of the effectiveness of this integrative model, development of a prototype Islamic Religious Education learning media that implements digital reinforcement and cognitive visualization, and longitudinal research on the influence of technology on the development of students' religious behavior. Implementation of this research can be realized through the development of a more systematic, technology-based Islamic Religious Education curriculum and digital learning that emphasizes pedagogical aspects, not just technical ones.

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