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Integration of 5E Learning and Islamic Values in Improving Students' Thinking Skills in the Digital Era

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Abstract

The advancement of the digital era necessitates an educational paradigm that emphasizes cognitive development, character formation, and students' higher-order thinking skills. This study explores the integration of the 5E learning model with Islamic values to enhance students' critical, creative, and reflective thinking abilities. Employing a qualitative descriptive approach, data were collected through interviews, classroom observations, and document analysis at SD IT Baitul Insan. The findings suggest that implementing 5E learning integrated with Islamic values significantly improves conceptual understanding, strengthens students' moral character, and enhances their analytical capacity to assess digital information. However, challenges such as limited resources and varying levels of educator preparedness still hinder full implementation. Thus, a more structured strategy and supportive policy framework are essential to ensure the sustainability and broader application of this integrated model.

Keywords: 5E learning; Islamic values; thinking skills; digital era

Introduction

The rapid advancement of digital technology in the era of globalization has significantly impacted various aspects of human life, including education. Technology offers students abundant opportunities to access information quickly and easily. However, this convenience also presents a major challenge: how to wisely filter information and cultivate critical and creative thinking skills amidst the flood of data and digital content. In this context, the development of students' thinking abilities is paramount, particularly in a digital era where information overload can shape mindsets and influence behaviors (Gunis, 2020). One promising approach to enhance students' thinking skills is by adopting active, inquiry-based learning strategies such as the 5E Learning model. This model encompasses five sequential phases—Engage, Explore, Explain, Elaborate, and Evaluate—designed to foster student engagement through investigation and reflective learning (Bybee, 2015).

Despite the urgent need to foster critical thinking in education, schools in Indonesia—particularly those serving Muslim students—face the additional challenge of integrating Islamic values into learning activities (“Education of Science, Technology, Engineering, and Mathematics International Conference, ESTEMIC 2021: STEM Education: Current and Future in Post-Pandemic Era,” 2023). Islam not only emphasizes spiritual development but also promotes rational and critical thought, as exemplified in the teachings of the Qur’an and ḥadīth. In the educational context, integrating Islamic values can strengthen students’ character by fostering wisdom, honesty, responsibility, and ethical reasoning in the pursuit of knowledge (Permana, 2021). Nevertheless, while awareness of the importance of value-based education is increasing, the actual integration of Islamic principles with research-driven, inquiry-based pedagogies like the 5E model remains limited.

Field observations show that while many schools have adopted active learning models, including 5E Learning, they often fall short in embedding moral and religious character education. For example, Sari and Indriani (2021) found that learning models focused solely on cognitive development tend to produce students who are intellectually capable but ethically underprepared, lacking in wise decision-making (Kosasih, 2024). Conversely, studies such as Wahid and Fauzi (2020) demonstrate that implementing Islamic values in the classroom can reinforce students’ moral and ethical foundations. However, these efforts are rarely aligned with structured, process-oriented pedagogies like the 5E model, highlighting a gap in the literature regarding the fusion of scientific exploration and religious character formation.

The novelty of this study lies in its effort to integrate two crucial dimensions of education—5E Learning and Islamic values—within the context of the digital age. The aim is to examine how this integration can enhance students’ critical and creative thinking while fostering character grounded in Islamic teachings, which are highly relevant to navigating today’s digital challenges. Through this combined approach, students are expected to not only develop cognitive skills but also demonstrate moral discernment in using technology responsibly and ethically.

The main objective of this research is to analyze the effects of integrating the 5E Learning model with Islamic values on the improvement of students’ critical and creative thinking in the digital era. This study also seeks to offer insights into how the convergence of scientific inquiry and ethical guidance can cultivate well-rounded learners—intellectually competent, morally grounded, and technologically responsible. Ultimately, this study aspires to contribute to the development of a holistic educational model that balances cognitive growth with character and spiritual formation in response to the demands of the digital age.

Literature Review

5E Learning

The 5E learning model is a constructivist instructional approach designed to engage students as active participants in their learning process (Lindquist, 2013). It consists of five interrelated stages: *Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*. Each stage plays a pivotal role in facilitating students’ conceptual development (Gunis, 2020). The *Engage* phase aims to spark students’ curiosity, typically through thought-provoking questions or scenarios. This stage is intended to motivate students to inquire further (Alegre, 2020). During the *Explore* phase, students are given the opportunity to

investigate concepts through experiments, observations, or collaborative discussions, allowing them to link new information to prior knowledge and personal experiences.



Figure 1 5E Learning Flow
Source: belajarstem.id

In the *Explain* phase, students begin to articulate their understanding, and the teacher introduces formal explanations, linking empirical findings to theoretical frameworks (Alegre, 2020). The *Elaborate* stage requires students to apply newly acquired knowledge to more complex or broader contexts, promoting deeper critical and creative thinking. Finally, the *Evaluate* phase provides a space for both students and teachers to assess learning outcomes, enabling reflection and feedback for further improvement.

The primary strength of the 5E model lies in its ability to support interactive, student-centered learning. In this framework, students are not passive recipients of knowledge but active constructors of understanding (Liu, 2021). The model promotes critical inquiry and creative problem-solving by encouraging continuous reflection and analysis throughout the learning process. It also fosters collaboration among students, enhancing their learning through peer interaction. In the rapidly evolving digital age, such skills are essential, as learners must be able to assess, interpret, and apply information with discernment (Jamaludin, 2023). In this regard, the 5E model is particularly relevant and effective.

Islamic Values

Islamic values are moral and ethical principles rooted in the teachings of Islam, derived primarily from the Qur'an, the *ḥadīth*, and scholarly interpretations (Zakiyyah, 2024). These values serve as comprehensive guidelines for ethical behavior in everyday life. In educational settings, Islamic values play a crucial role in character development, encouraging learners to act with integrity, humility, and justice. Core values emphasized in Islamic education include *īmān* (faith), *taqwā* (piety), *ṣidq* (honesty), *ʿadālah* (justice), *amānah* (responsibility), *ṣabr* (patience), and *rahmah* (compassion) (Sabiq, 2022).

For instance, honesty nurtures integrity and truthfulness in academic and social interactions, while justice instills a respect for others' rights and objectivity in thought. Responsibility teaches accountability in both academic and societal roles (Astuti, 2023). Patience is key to overcoming learning challenges, while compassion fosters empathy and cooperation.

The integration of Islamic values into education not only aims to produce academically successful students but also morally upright individuals (Amir, 2023). These principles help guide students in making ethical decisions, particularly in the

digital era, where ethical dilemmas and misinformation are prevalent. When Islamic values are embedded into the learning process, students are encouraged to engage with knowledge critically and ethically, contributing to the formation of a generation that is both intellectually capable and morally responsible.

Students' Thinking Ability

Students' thinking skills—comprising critical, creative, and reflective thinking—are foundational to meaningful learning. Critical thinking involves the objective analysis and evaluation of information, enabling students to assess arguments, distinguish facts from opinions, and formulate reasoned conclusions (Raj, 2020). Creative thinking, on the other hand, refers to the generation of novel ideas and innovative problem-solving approaches, fostering the capacity to view challenges from multiple perspectives (Hernández-Torrano, 2020). Reflective thinking allows learners to assess their learning experiences, deepening their understanding and promoting self-improvement.

In today's information-rich society, these thinking skills are more essential than ever. The digital era has ushered in unprecedented access to information, requiring students not only to consume content but also to evaluate its credibility and relevance. Instructional models like 5E Learning are well-suited to nurture such cognitive skills by involving students in hands-on inquiry, collaborative exploration, and structured evaluation (Errabo & Ongoco, 2024). As a result, students are trained not only to memorize facts but also to analyze, synthesize, and apply knowledge creatively and ethically.

Digital Era

The digital era is marked by rapid technological advances and the widespread availability of information, significantly transforming educational environments. While digital tools offer vast educational opportunities, they also introduce challenges such as information overload, data manipulation, and ethical concerns in digital behavior. In this context, students must be equipped with critical, creative, and reflective thinking skills to navigate the complexities of digital life (Syarif, 2020; Scuotto, 2021).

Students must learn to evaluate sources critically, verify the authenticity of content, and use technology ethically. Pedagogical models like 5E Learning are especially effective in addressing these demands. By promoting inquiry-based exploration and value-driven reflection, such models prepare students to act wisely in the digital world (Octaviani, 2022; Saifillah, 2023). Education in the digital age must therefore combine technical literacy with moral integrity to prepare learners for the ethical use of information and communication technologies.

Method

This study employed a descriptive qualitative approach to investigate the implementation of learning that integrates Islamic values with the 5E learning model and its impact on students' thinking skills at SD IT Baitul Insan (Thohir et al., 2023). The aim of this study was to gain comprehensive insights into how the combination of Islamic values and the 5E learning model contributes to the development of students' critical, creative, and reflective thinking abilities.

Research Design

This research was exploratory in nature and focused on analyzing classroom interactions, teachers' and students' perceptions, and the process of integrating Islamic values and the 5E model into teaching and learning. Data were collected through multiple qualitative methods, including interviews, observations, and document analysis of classroom activities conducted at SD IT Baitul Insan.

Data Collection Technique

Data were gathered using the following qualitative techniques:

1. In-depth Interviews

Semi-structured interviews were conducted with teachers, students, and the school principal to capture their perceptions regarding the implementation of Islamic values-based learning combined with the 5E model. These interviews aimed to explore their views and firsthand experiences on how this integrated model influences students' cognitive development (Ma'arif, 2023).

2. Participatory Observation

The researcher conducted direct classroom observations to document the teaching and learning process, with a specific focus on the five stages of the 5E model (*Engage, Explore, Explain, Elaborate, Evaluate*) and the ways in which Islamic values were integrated at each stage (Wahab, 2022). These observations took place over several sessions to ensure a thorough understanding of teacher-student interactions and classroom dynamics.

3. Documentation

Relevant documents—including lesson plans (RPP), instructional materials, and student assignments—were collected to examine how the 5E learning approach was structured and how Islamic values were embedded into it. These documents were used to complement and triangulate the findings from the interviews and observations.

Data Analysis Techniques

Data analysis was conducted using NVivo 12 software, which facilitated the organization and interpretation of data from interviews, observations, and document reviews at SD IT Baitul Insan. The analysis began with coding text segments according to key themes such as 5E learning, Islamic values, and students' thinking abilities (Harahap, 2020). These codes were then categorized into broader thematic patterns using NVivo's query features.

To enrich the analysis, the researcher utilized visualization tools—such as word clouds and concept maps—to illustrate the interconnections between identified themes. The validity of findings was strengthened through triangulation and member checking. The final report includes in-depth qualitative interpretations, supported by direct quotes from participants and relevant visualizations derived from the coding process.

Results and Discussion

The following section presents the *Research Node Table*, which outlines the conceptual structure of this study on the integration of 5E Learning and Islamic values in enhancing students' thinking skills within the digital era. This table maps the core

categories (Nodes), subcategories (Child Nodes), and further elaborations (Sub Child Nodes) to illustrate the essential dimensions explored in the literature and field data.

This framework serves to visualize how key concepts—such as the 5E Learning model, Islamic educational values, students' cognitive skills, and the relevance of pedagogical strategies in the digital context—interrelate in constructing an effective, value-oriented learning paradigm.

Table 1 Research Nodes

Node	Child Node	Sub Child Node
5E Learning	Definition and Concept	Model-based constructivism
		Five stages of learning (Engage, Explore, Explain, Elaborate, Evaluate)
	Stages 5E Learning	Engage: Interesting student attention. Explore: Experiments & discussions. Explain: Organization & explanation draft. Elaborate: Application analysis more carry on. Evaluate: Reflection and feedback come back. Push learning active
		Advantages of the 5E Model Develop critical and creative thinking. Increase student involvement in the learning process
Islamic Values in Education	Definition and Sources of Islamic Values	Quran & Hadith Understanding of Scholars Faith & Piety Honesty
		Justice Responsibility Patience
	Principles of Islamic Values in Education	Strengthening student character through Islamic marks Ethics in thought and action Retrieval of moral-based decisions Think Critical
		Islamic Values in Learning Think Creative Think Reflectively
Ability Think Student	Type Ability Think	Analysis complex information Retrieve a wise decision.
	Role in the Digital Age	Information information overload Digital security ethical use of technology Encourage exploration based on a study. Teach students to sort and analyze information
Relevance of 5E Learning in the Digital Era	Challenges of the Digital Era	Blending scientific method with moral values Develop Islamic character in learning. Students are more critical and creative in thinking.
	5E Learning as a Solution	Increase understanding of ethics in using technology.
Integration of 5E Learning with Islamic Values	Integration Concept	
	Positive Impact	

This study investigates how the integration of 5E Learning and Islamic values can support students' development of higher-order thinking skills in a digital context. The 5E model, based on constructivist principles, comprises five phases—*Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*—that together cultivate deep, student-driven learning. Each phase contributes uniquely: *Engage* initiates curiosity, *Explore* promotes inquiry, *Explain* structures knowledge, *Elaborate* extends application, and *Evaluate* supports reflection and growth.

This model's main strength lies in fostering active participation, critical reasoning, and creativity, all of which are crucial in navigating a digitally saturated environment. Students learn not only to absorb content but to filter, assess, and apply information independently and responsibly.

Simultaneously, the incorporation of Islamic values into education serves as a moral compass for students. These values, rooted in sacred texts and religious tradition, help shape learners into ethical individuals capable of making responsible decisions. In a world where technological advancement often outpaces ethical understanding, such grounding is increasingly vital.

The integration of these two approaches—constructivist learning and Islamic ethical values—creates a comprehensive educational model. It equips students to be not only intellectually competent but also morally grounded in their digital engagements.

Distribution of Research Nodes

The following figure offers a conceptual representation of the relationship between the 5E Learning model and Islamic values in enhancing students' thinking skills. This diagram illustrates how each phase of the 5E model aligns with key elements of Islamic ethics, helping to address the challenges faced by students in the digital era. By understanding this relationship visually, we gain clearer insight into how the integration of these educational dimensions supports the creation of a more holistic, structured, and value-based learning process.

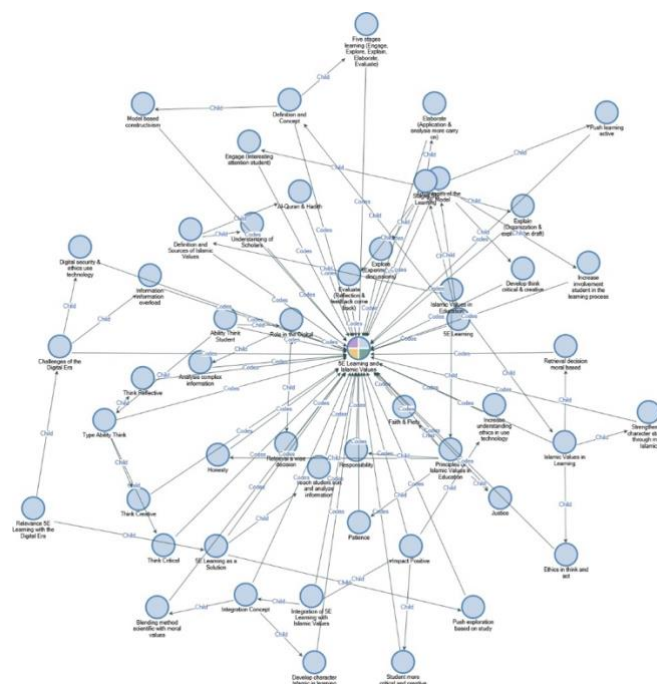


Figure 2 Distribution of Research Nodes

This figure emphasizes that the 5E Learning model—with its five stages: *Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*—is a constructivist approach that encourages students to be active participants in constructing knowledge. This model enhances students' involvement, fosters deeper reflection, and strengthens their capacity for critical and creative thinking. In the digital era, where learners are constantly exposed to a flood of information, such an approach becomes increasingly vital.

A key factor in maximizing the effectiveness of the 5E Learning model is the incorporation of Islamic values into the learning process. Values such as honesty (*ṣidq*), patience (*ṣabr*), justice (*ʿadālah*), ethical reasoning, and faith (*īmān*) help to cultivate students' character—intellectually and spiritually. By embedding Islamic principles into each learning stage, students are not only trained to think analytically, but also guided to act ethically when processing and utilizing information. This ethical lens empowers students to be more morally aware and socially responsible in both academic and digital contexts.

As technology continues to evolve, students encounter growing challenges related to digital literacy, including information filtering, ethical dilemmas, and online behavior. The integration of the 5E Learning model with Islamic ethical principles enables students to develop a systematic, reflective, and value-conscious mindset. This includes fostering awareness around digital safety and the responsible use of technology in accordance with Islamic teachings.

Ultimately, this integration offers a learning model that not only supports cognitive growth but also cultivates strong character and moral sensibility. It equips students to engage critically with digital content while maintaining ethical integrity, enabling them to become individuals who are both intellectually competent and morally upright in navigating the complexities of the digital world.

Research Node Hierarchy

The following table provides a comprehensive overview of the structural hierarchy of concepts examined in this study. It organizes the various elements of 5E-based learning and Islamic values, students' cognitive development, and their relevance in facing the complexities of the digital era.

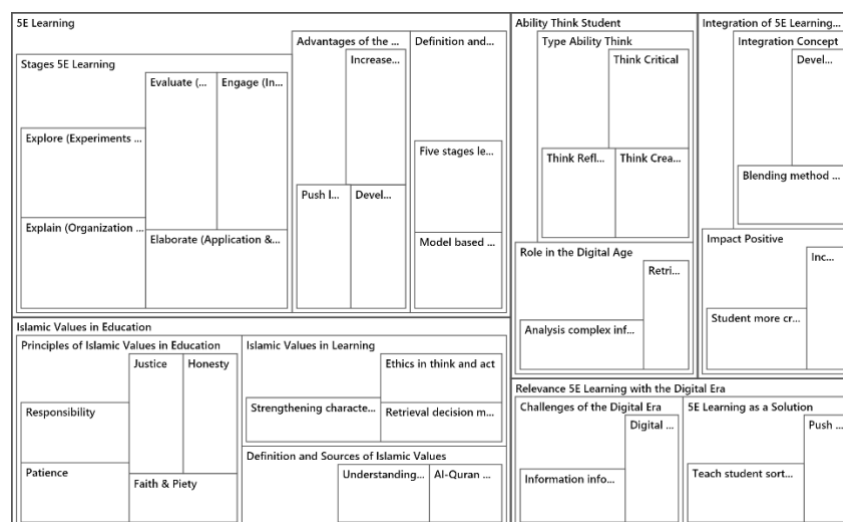


Figure 3 Research Node Hierarchy

In contemporary education, constructivist-based learning models have become effective strategies for fostering deeper understanding. The 5E Learning model, which comprises the phases of *Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*, facilitates this process by promoting active participation and reflective thinking. However, when this model is enhanced through the integration of Islamic values, it gains a broader dimension—supporting not only cognitive development but also moral and spiritual formation.

Islamic principles such as *justice* (*‘adālah*), *honesty* (*ṣidq*), *responsibility* (*amānah*), *patience* (*ṣabr*), *faith* (*īmān*), and *piety* (*taqwā*) serve as fundamental pillars for ethical reasoning. These values guide students in developing a moral perspective that complements their intellectual engagement. Particularly in the digital era—characterized by vast, unfiltered streams of information—students require both analytical tools and ethical filters.

Thinking skills fostered by the 5E model are particularly relevant in helping students navigate this complex landscape. *Critical*, *creative*, and *reflective* thinking enable learners to understand concepts thoroughly and apply them in real-world contexts. In the *Elaborate* and *Evaluate* phases, students are encouraged to consider not only the factual basis of content but also its ethical implications, which enhances their capacity for moral judgment.

This integrative approach ultimately supports the development of holistic learners who possess scientific literacy and uphold high ethical standards. Students are guided not only toward academic achievement but also toward becoming individuals with integrity, social awareness, and the ability to make responsible decisions in digital environments.

Node Graph

The node graph below illustrates the results of NVivo coding analysis based on interview data regarding 5E-based learning and the integration of Islamic values. The graph shows the percentage coverage of key themes that emerged from the analysis.

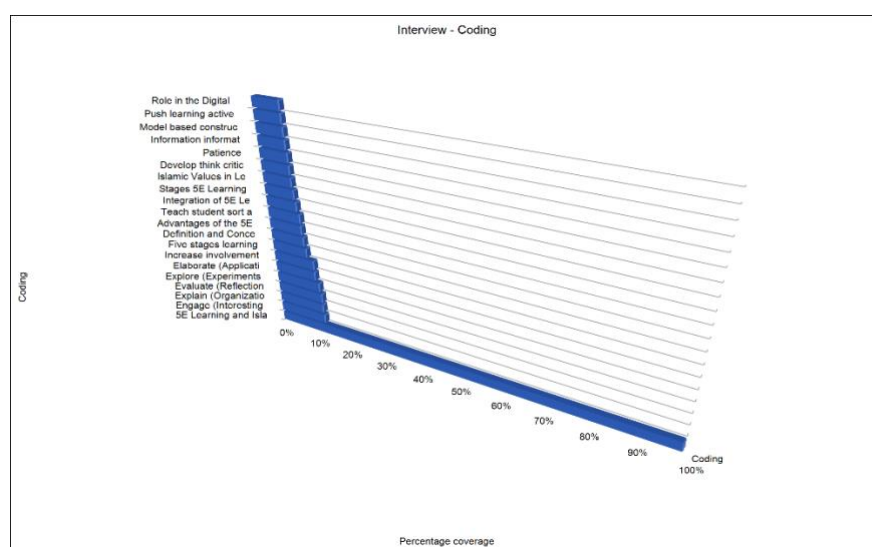


Figure 4 Percentage of Research Nodes

The most dominant nodes in the coding analysis include “Role in the Digital Era,” “Promoting Active Learning,” “Constructivist-Based Model,” and “Information.” These

highlight the central focus on the impact of digitalization, the importance of learner engagement, and the pedagogical foundation of the 5E model.

Other frequently occurring concepts include *patience*, *critical thinking* (Develop Think Critic), and *Islamic Values in Learning*, indicating a strong emphasis on character development and value-based education alongside cognitive objectives (Sungguh Ponten Pranata et al., 2021). Each phase of the 5E model (*Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*) also appears with varying levels of prominence, reflecting their consistent presence in the learning process.

This graph reinforces the conclusion that combining constructivist methodologies with Islamic ethics forms a relevant and robust educational response to the challenges of modern digital life. It underlines the need for more reflective, participatory, and character-centered learning practices.

Word Cloud

The word cloud provides a visual summary of the most frequently mentioned terms during interview sessions, revealing the key concepts that dominate discussions related to the implementation of 5E Learning integrated with Islamic values.



Figure 5 Word Cloud

Interview Word Cloud

The word cloud prominently features terms such as “learning,” “students,” “Islamic,” “values,” and “stage,” highlighting the central themes of value-oriented education and student engagement through the 5E framework. Other notable words—such as “teachers,” “thinking,” “method,” “integration,” and “explain”—further emphasize the instructional dynamics and the teacher’s role in guiding student development.

This visualization underscores the interdisciplinary relevance of the 5E model, especially in science, social science, and religious education. It also reflects the implementation challenges faced in adopting this model comprehensively, while reinforcing the importance of integrating ethical values into modern learning practices.

Word Frequency

Table 2 presents the frequency of word occurrences extracted from the interview transcripts. These frequencies indicate the key themes and ideas most commonly emphasized by respondents when discussing the integration of the 5E learning model with Islamic values.

Table 2 Frequency of Word Occurrence in Interviews

Word	Length	Count
information	11	28
integration	11	19
implementing	12	16
discussions	11	14
understand	10	14
experiments	11	12
especially	10	11
understanding	13	11
exploration	11	9
responsibility	14	9
challenges	10	8
developing	10	8
scientific	10	8
custom	10	7
implemented	11	7
interesting	11	7
strategies	10	7
differences	11	6
discussing	10	6
effectively	11	6

The word “**information**” leads the count with 28 mentions, signaling the central role that information plays in digital-era education. The terms “**integration**” (19) and “**implementing**” (16) further reflect the importance of harmonizing educational approaches and applying them effectively. Words such as “**understand**,” “**experiments**,” and “**responsibility**” highlight the dual focus on cognitive development and moral formation within the learning environment.

These patterns affirm the critical link between active, inquiry-based learning and the ethical orientation fostered by Islamic values, particularly as learners interact with vast, unfiltered information in digital settings.

Discussion

Interview findings offered diverse perspectives on the integration of Islamic values into 5E-based learning. Analysis of keyword frequency revealed dominant themes such as *information*, *integration*, and *application*, reflecting stakeholders' concerns regarding the structure and moral dimensions of education.

One respondent emphasized:

"Students' understanding will improve when they are provided with systematic information aligned with their learning context" (Pranata & Husain, 2022).

This aligns with constructivist theory, which supports structured and contextualized knowledge construction (Hidayat, 2021).

Another respondent remarked:

"Learning based on Islamic values must be embedded in the curriculum—not just added as a supplement."

This highlights the need for a curriculum-wide integration of moral education, consistent with Muspiroh's (2014) findings, which suggest that embedding Islamic values in science education enhances conceptual comprehension and practical application (Azka, Nurhalisa, & Haramain, 2024).

Regarding pedagogical innovation, a teacher shared:

"Students need opportunities to explore and experiment to deeply grasp the concepts."

This sentiment resonates with the exploratory nature of the 5E model, which involves experiential learning through its five phases. Supporting this, Sujarwo et al. (2023) found that applying the 5E Learning Cycle in Islamic religious education significantly improved student learning outcomes.

Nevertheless, several implementation challenges were identified. These include resource limitations and differing interpretations of Islamic values. Hidayat (2021) notes that the integration of Islamic ethics into education must be context-sensitive and supported by teacher capacity development to ensure effectiveness.

In conclusion, the findings affirm that integrating Islamic values with the 5E Learning model has the potential to significantly enhance educational quality. However, the success of this approach hinges on comprehensive strategies, curricular integration, educator readiness, and the availability of appropriate resources.

Conclusion

This study has demonstrated that integrating the 5E learning model with Islamic values has a significant impact on enhancing students' thinking skills in the digital era. The 5E model, grounded in constructivist theory, provides a systematic framework for deepening students' understanding through five key phases: *Engage*, *Explore*, *Explain*, *Elaborate*, and *Evaluate*. This pedagogical structure not only supports conceptual mastery but also cultivates critical, creative, and reflective thinking skills.

Furthermore, the incorporation of Islamic values—such as honesty (*ṣidq*), responsibility (*amānah*), justice (*ʿadālah*), and patience (*ṣabr*)—plays a vital role in shaping students' ethical character. These values help guide students in navigating information critically and using technology responsibly in a moral framework.

Despite its benefits, the study also identified several challenges, including limited resources, varying interpretations of Islamic principles, and the readiness of

educators to implement integrated learning models. These factors underscore the need for a more structured and well-supported approach to integration.

Overall, the integration of the 5E learning model with Islamic values presents a holistic and contextually relevant strategy for education in the digital age. This model promotes not only academic excellence but also moral integrity, preparing students to become intellectually capable and ethically grounded individuals equipped to face the complexities of modern society.

Recommendations

To optimize the implementation of this integrated learning model, the following recommendations are proposed:

- a. **Teacher Training:** Intensive training programs are essential to equip educators with the knowledge and skills required to effectively implement the 5E model alongside Islamic values. Such training should focus on pedagogical techniques, value integration strategies, and digital literacy.
- b. **Curriculum Development:** Educational institutions should design and revise curricula that are flexible and adaptive, enabling the seamless integration of 5E learning strategies with Islamic ethical principles across various subjects.
- c. **Provision of Resources:** Governments and school administrations must ensure the availability of adequate teaching materials, technological tools, and support systems to facilitate the implementation of this integrated model.
- d. **Digital Literacy and Ethics:** Students must be provided with structured learning experiences that enhance their digital literacy, particularly in terms of ethical internet use, information verification, and responsible online behavior.
- e. **Continuous Evaluation and Research:** Further empirical research and ongoing evaluations are necessary to assess the effectiveness of the integration and to identify areas for improvement. Regular feedback from teachers and students should inform future refinements.

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