INSTILLING ISLAMIC VALUES ON STEAM LEARNING IN EARLY CHILDHOOD EDUCATION TO PRODUCE ISLAMIC SCIENTIST

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Abstract: M*ost early childhood education institutions in Indonesia are affiliated with Muslim groups to educate future intellectuals or clerics who are knowledgeable about religion and scientists who advance science. This study investigates the integration of Islamic values with the science, technology, engineering, and mathematics (STEM) field. The qualitative phenomenological method was employed in the research. The study enrolled 44 teachers and principals from eight Islamic kindergartens (Raudhatul Athfal) in five cities and districts throughout three provinces. The investigation revealed that instructors of Islamic Kindergarten/Raudhatul Athfal instill Islamic values into the STEAM curriculum by 1) integrating Islamic themes, 2) conducting Tarbiyah Imaniyah and Islamiyah, 3) utilizing technological media, and 4) referencing the Qur'an and Hadith. The researchers concluded that implementing Islamic-based STEAM learning in Islamic Kindergarten/ Raudhatul Athfal is characterized by reoccurring themes, which are subsequently translated into STEAM learning activities. The researchers urge Islamic Kindergarten/ Raudhatul Athfal teachers to incorporate Islamic values throughout all STEAM curriculum components continuously.*

Keywords: *Faith, Islamic Thematic, STEAM, Islam, Technology Media*

A. Introduction

Early childhood is a golden phase in the growth and development of human life (Rahiem, Abdullah, & Krauss, 2020). It is a sensitive period; children are like sponges during this time. They absorb what is in their environment (Putra, 2020). Six aspects of development must be stimulated appropriately so children's development can develop adequately: moral, religious, cognitive, physical, motor, social-emotional, language, and artistic values (Enah Suminah et al., 2018).

The inculcation of religious and moral values is necessary to prevent ethical disruption and to build a solid foundation that can prevent negative influences on children (Nudin, 2020). Early childhood is the right time to instill Islamic education values in children (Slamet, 2020). According to Jame Fowler's theory of the stages of faith, at this age, children are in the intuitive-projective stage, where they are actively asking about the consequences of their free mind that has not been entirely constructed. Children are also influenced by the examples, moods, symbols, and actions of close ones, and they have difficulty distinguishing between fantasy and reality (Rustam et al., 2021). Therefore, instilling religion and morals at this age is very appropriate.

The Minister of Education and Culture, Nadiem Makariem, said that students should be free to improve their quality further and develop themselves in various fields of expertise. One of the crucial components in efforts to improve the quality and self-development of students is to master Science, Technology, Engineering, Art, and Mathematics (STEAM) (Media, 2020). In educational science discourse, STEAM is an additional element of art (art) in STEM that aims to increase creativity, innovation, problem-solving skills, and other cognitive benefits for students (Zubaidah, 2019).

The Rhode Island School of Design initiated STEAM by adding "arts" to the STEM framework, which aims to foster innovation by combining the mind of a scientist or technologist with that of an artist or designer (Zubaidah, 2019). Maeda (2013) said that the purpose of the STEAM approach is to help teach science concepts, make students think about and work with art, and inspire students to be unique and creative across

disciplines. Through STEAM, students explore and make connections between art, music, science, and other sciences. Indonesian students need STEAM learning to practice skills in dealing with 21st-century problems (Maeda, 2013).

Al-Khalili, a professor of Muslim theoretical physics from the UK, argues that most Muslims believe that the current rapid development of science and technology is far from religious values (Al-Khalili, 2010). Furthermore, he believes that the tendency to develop science will keep students away from religious values. It is not supposed to happen and is unhistorical.

Muslim scientists laid the foundations for the development of science in the golden age (Al-Khalili, 2010). Muslims must be reminded that Islam and science do not contradict each other (Sayuti & Rahiem, 2020). Muslim scholars preserve Islamic knowledge and make significant new contributions to basic science and technology. Fundamental contributions in fields such as astronomy, chemistry, mathematics, philosophy, geography, and physics are the foundation of modern science and technology (Afridi, 2013). Therefore, the STEAM program in Islamic educational institutions is expected to form Muslim seeds that excel in Islamic knowledge and STEAM. STEAM is a learning approach that integrates six fields of science, namely science, technology, engineering, arts, and mathematics (Sari & Rahma, 2019). Early childhood STEAM implements STEAM concepts and skills through games (Gloria Julius, 2021). Early childhood STEAM learning emphasizes active discovery to develop language skills, problem-solving, and reflection. STEAM in early childhood integrates six fields of knowledge in a meaningful context, and teachers can incorporate the material and the learning process (Sandra M. Linder and Angela Eckhoff, 2020).

Creativity, problem-solving skills, and understanding of the surrounding environment can be stimulated through increased mastery of STEAM (Wahyuningsih et al., 2020). STEAM-based learning can also effectively improve 4C (Creativity, Communication, Collaboration, and Critical Thinking) abilities in children aged 4-5 (Prameswari & Anik Lestariningrum, 2020). As a result, STEAM-based learning is highly recommended for early childhood education

tailored to developmental stages. However, most have yet to be well integrated when implementing STEAM in several early childhood education institutions, especially at the kindergarten level. (Munawar & Roshayanti, 2020). Based on the statistics of the Early Childhood Education Institutions Data and Information Technology Center by the Ministry of Education and Culture in 2019/2020, early childhood education institutions in Indonesia are primarily private institutions under foundations (Kemdikbud, 2020). Most early childhood education institutions are founded on Islamic principles. Thus, many kindergartens, which are part of early childhood education institutions, are also based on Islam. It broadly influences early childhood education in Indonesia, including the STEAM-based learning process in kindergarten (Rahiem, Abdullah, & Rahim, 2020).

Fauzi et al. explained that there are criteria for choosing an educational model in the millennial era: schools that provide religious material and combine religion and science (Fauzi et al., 2019). One of the reasons parents want their children to attend a school with a vital Islamic component is that their children have solid religious knowledge and strong academic abilities (Suyatno, 2015). Schools that can provide a good understanding of religion and are also able to develop children's scientific skills are in great demand by parents. Ideally, early childhood Islamic educational institutions can prepare children to become scholars, and scholars are scientists.

Teachers have a strategic role in improving the quality of education (Djollong & Akbar, 2019). Based on Republic of Indonesia Law Number 14 of 2005, Chapter 2, Article 4, concerning Teachers and Lecturers, a teacher has duties, among others, as an educator, a student, a mentor, a director, a trainer, and an assessor. In addition, teachers also have a role as learning agents and are responsible for improving the quality of national education (*UU No. 14 Tahun 2005, Tentang Guru Dan Dosen*, 2005). Based on the things above, the teacher's ability to prepare the learning process is essential, including STEAM learning that integrates the cultivation of religious and moral values. How do Islamic kindergarten teachers teach Islamic values in STEAM learning? This question

becomes the formulation of the problem in this study. While this research aims to explore how early childhood Islamic education institutions teach Islamic values in STEAM learning.

B. Method

This study uses a qualitative, phenomenological approach. A phenomenological research approach aims to explain the nature of phenomena by examining them from the point of view of the subject who experiences them (Rahiem & Novi, 2022). This research was conducted in Islamic kindergartens located in several areas: Pekalongan and Pemalang, Central Java; Serang and South Tangerang, Banten; and Depok, West Java.

Data was collected through semi-structured in-depth interviews, observation, and document collection. Interviews were conducted with 44 informants, consisting of 8 kindergarten principals and 36 teachers. Participants were the head of the kindergarten and taught in 5 Islamic kindergartens and 3 Islamic kindergartens: AP Kindergarten Pekalongan, Central Java; DM Kindergarten Pemalang, Central Java; AA Kindergarten Serang, Banten; MM Islamic Kindergarten South Tangerang; NA Kindergarten Tangerang, South Banten; IP Kindergarten Tangerang, South; and RF Islamic Kindergarten Depok, West Java. The names of the kindergartens were disguised, as were the informants, to protect the informants' identities and give them the freedom to explain their experiences.

Selection of resource persons or research samples based on specific criteria (purposive sampling)The sample criteria are teachers who have taught in an Islamic Kindergarten (Raudhatul Athfal) for a minimum of three years. At the beginning of the research, the researcher sent a letter of permission to the Islamic Kindergarten/Raudhatul Athfal. The willingness of Islamic kindergartens is demonstrated verbally by permitting researchers to conduct interviews, make observations, and collect related documents. Interviews were conducted face-to-face, with the researcher coming to the Islamic Kindergarten by appointment in advance. Observations were made to observe the process of learning activities carried out online and offline, following the policy of the teaching and learning process at the Islamic Kindergarten. Online observations were conducted in

one Islamic kindergarten and one Raudhatul Athfal that had an online learning policy via Zoom Meeting.
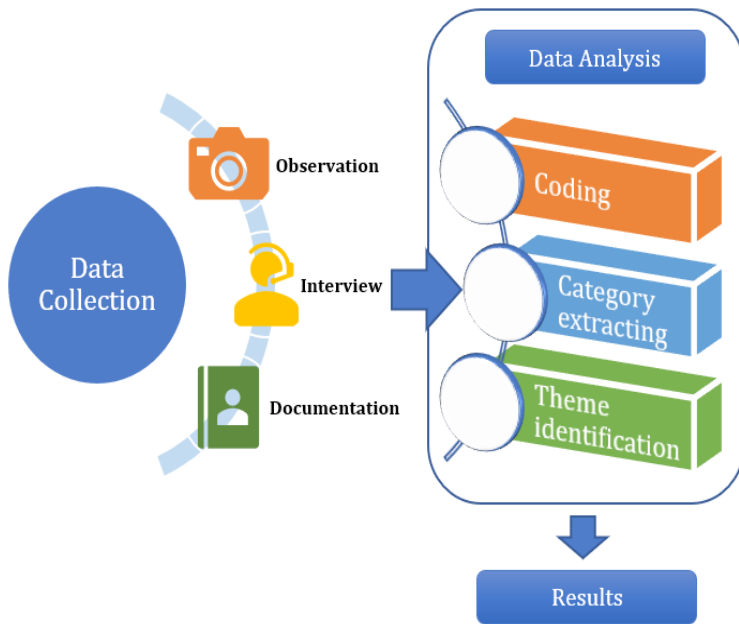

Figure 1. Methodology

The data analysis in this study used a content analysis model. The analysis step in this study went through 3 stages (Figure 1) following the modes of Rahiem, Fitri, and Fairuz (2022), which were adapted from Braun and Clarke (2006): First, the transcription was read repeatedly to find similar concepts in coded form, and then codes were collected in larger groups, namely, categories, which were then identified as a theme. The process of data analysis from coding to theme identification aims to explain how the efforts of Islamic Kindergarten/Raudhatul Athfal teachers in teaching Islamic values in STEAM learning produce scholars who are scientists and scholars who are scholars (Rahiem et al., 2022).

As a guarantee of the validity and credibility of the data, the researcher followed the method used by Rahiem and Novi (2022). The researcher triangulated the data using different data collection sources: interviews, observations, and

documentation. In the data analysis process, the research team simultaneously compared the codes from each researcher, which were then compiled into the approved codes, categories, and themes. Researchers also use direct quotes from interviews and observation notes to show the inductive thinking process and conclude research results (Rahiem & Novi, 2022).

C. Result and Discussion

This study found that Islamic Kindergarten teachers teach Islamic values in STEAM learning by 1) integrating Islamic thematics; 2) carrying out Tarbiyah Imaniyah and Islamiyah; 3) using technology media; and 4) referring to the Qur'an and Hadith (Figure 2).
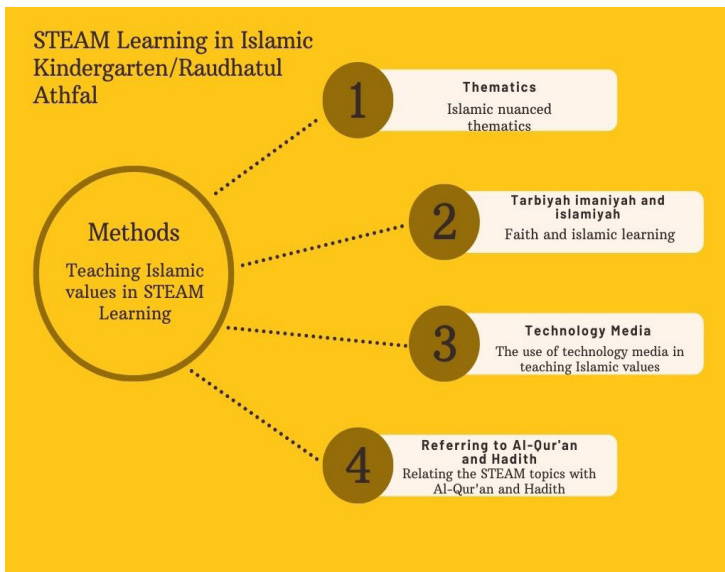

Figure 2. Findings

Islamic nuanced thematics learning

Islamic Kindergarten/Raudatul Atfal teachers have tried to teach Islamic values in STEAM learning in various ways. Integrating nuanced Islamic thematics into all STEAM learning activities is one way to teach Islamic values in STEAM learning.

On the food theme, the teacher, in addition to explaining the variety of food, also explains Islamic values, such as distinguishing between right and wrong. "At the time of learning the food theme, it was taught which food was halal and which was haram." Furthermore, it is explained which animals are halal and haram to slaughter and eat for their meat (UL/DM Kindergarten Teacher). The teacher explained that they introduced Islamic values in engineering lessons by assigning crafts to make prayer mats or other crafts about worship practices. Engineering learning activities in early childhood education include building structures or objects by cutting, sticking, and assembling something to use (Major, 2018). In the activity of making prayer rugs, they learn about how to make prayer rugs and about the uses of these prayer rugs. "Children make prayer rugs from patchwork that can be used for prayer practices." "(They) make iqro places using used materials and make pictures to introduce the pillars of Islam, according to Islamic themes that can be used for learning in class" (MU/NA Kindergarten Teacher).

In art learning, PU explained that the teacher had applied Islamic themes to the creative activities carried out by children, including coloring, drawing, singing, acting, and paper folding. In introducing Islamic themes, songs and other artistic activities can be used, such as the song Asmaul Husna, about the pillars of Islam. In addition, children also learn about other arts such as collage, coloring, and drawing with Islamic themes, including dramas about stories in Islam, such as the story of Prophet Ibrahim PBUH and songs about the names of letters and their meanings. Folding paper vehicle patterns created by humans and making collages of plants and mountains, which are God's creations, introduce the pillars of faith. (PU/Head of MM Raudhatul Athfal).

AP, the Head of AA Kindergarten, also added that the teachers took advantage of the commemoration of the Prophet's birthday to teach children about praying to the Prophet. Through Islamic clothing fashion shows, calligraphy coloring, and Pildacil activities, they develop artistic creativity while practicing public speaking skills. Pildacil is a children's

preaching competition. "In art classes, we teach sholawatan (a prayer or salutation to Prophet Muhammad PBUH) calligraphy coloring."There is a celebration of the Prophet's birthday, there are coloring contests, Pildacil, fashion shows, and there is also a celebration of the Prophet's birthday at the Isra Mi'raj event."(AP/Head of AA Kindergarten) Learning activities with various activities to instill Islamic values are also in line with what was expressed by Hayati (2021). She revealed that planting Islamic values could be done by commemorating Islamic holidays and playing roles on the themes of responsibility, honesty, mutual respect, and love-buying and selling activities (Hayati, 2021).

In learning mathematics and the concept of numbers, the teacher uses examples of cycles of prayer and introduces numbers in Arabic. "At the time of learning mathematics, the teacher taught the number of rak'ahs of prayer." In addition. The teacher also teaches how to write Arabic numbers with hijaiyah letters. (AT/DM Kindergarten Teacher) In line with the activity, YA added that the teacher had also taught number recognition by giving examples of the number of angels that must be known and the number of apostles in Islam. "In mathematics, the teacher teaches the number of rak'ahs in prayer, how many rak'ahs for maghrib, and how many rak'ahs for isha. "Count in ablution, the number of angels, and the number of prophets." Teacher (YES/AF Raudhatul Athfal). A similar opinion was conveyed by WA, who emphasized that he introduced religious knowledge and worship practices in mathematics:

> Mathematics can not be separated from the basic concept of numbers. We know the names of the days and the number of days. Then we also introduce the practice of ablution. We also teach how many parts of the body we have to wash during ablution, one wash hands, these two, three that, later counted. The child chooses the numbers and then later arranges them according to the order (WA / AA Kindergarten Teacher).

MA, a teacher at MM Kindergarten, added that he also brought Islamic nuanced thematic to mathematics learning. "Introduction to Mathematics by counting the number of verses memorized through songs in each

letter of the Qur'an." When telling the story of Noah, the children were invited to count the number of animals that joined Noah's Ark. (MA/MM Kindergarten Teacher).

Generally, learning in early childhood education applies the thematic learning model (Kuswanto & Pratiwi, 2020). Thematic learning is a learning activity that combines several materials on a particular theme, focusing on the activities of students who actively participate in solving problems to develop creativity based on the diverse potential of each child (Muklis, 2012). Some of the characteristics of the thematic learning model are: (1) focusing on the active participation of children in learning; (2) providing real experiences in the form of actual activities for children as an early stage of understanding more abstract things; (3) discussing themes in the learning process around pretty familiar children; (4) providing knowledge and skills according to developmental aspects; (5) having a flexible nature in the preparation of materials and themes that are suitable for children's environmental conditions; (6) providing flexibility for children to learn according to their wishes and the needs of children so that their potential can develop optimally; and (7) applying the principles of learning while playing, which is impressive (Hayati, 2021).

Islamic thematic learning activities are integral to Islamic Kindergarten and Raudhatul Athfal (Inawati, 2017). Learning activities with Islamic thematics in science play activities can introduce children to natural laws, or sunnatullah, about the universe, provide experience for reciting Kauniyah verses and increase faith in Allah the Almighty (Rahmawati & Samedi, 2020). Children perform experimental activities in science play by following the teacher's directions. In this activity, children learn religious and moral values such as honesty by conducting experiments, taking responsibility for what is being done, and maintaining personal and environmental hygiene after completing the experiment (Herni, 2018).

Other learning activities that combine several subject matters with Islamic thematics are learning activities with the MELESAT approach (Mathematics, Existence, Literacy, Engineering, Science, Art, and Technology) (Imaduddin, 2017). MELESAT learning can be infused with Islamic

values in the form of aqidah values, monotheism, or Islamic character values. Islamic themes can also be associated with education, science projects, living things, or the environment. Learning activities like this are expected to train critical thinking, problem-solving, and systematic and logical thinking and get to know Allah's creation (Susetyo et al., 2021).

Islamic values can also be instilled by incorporating them into groups of learning programs in all development fields (Amiruddin, 2016). Amiruddin also stated that the areas of development integrated with Islamic values include the scope of development of moral and religious values, physical, fine motor, and gross motor development, cognitive, language, and social-emotional (Amiruddin, 2016). The integration of Islamic values in learning is also carried out in several areas, such as in Majene (Amiruddin, 2016), Cianjur (Rosnaeni, 2021), Sleman (Rahmawati & Samedi, 2020), Bandung (Watini, 2019), and Cirebon (Nurhayati, 2016). Some of the outcomes of inculcating Islamic values in early childhood include: a) embedding religious basics in the form of faith in children in their golden years; b) training them to perform rituals of worship from an early age; c) becoming accustomed to good character; d) learning how to read the Qur'an from an early age; and e) getting them used to the pronunciation of the Quran from an early age (Nurhayati, 2016).

Teaching Islamic Faith and Knowledge

STEAM learning activities can also teach the concept of divinity and provide Islamic materials that can increase young children's faith and Islamic knowledge. The teacher has tried to introduce the idea of monotheism as well as basic Islamic concepts that young children can learn.

FA, an AP kindergarten teacher, explained that they had learned science by introducing the concept of divinity. "... for example, planting activities. Usually the land is empty, there are no plants, and so on. Then, when you are given seeds, why do they suddenly appear, and so on. Who can grow it?" (FA/AP Kindergarten teacher). The environment around the school can also be used for the science learning process and the introduction of the concept of divinity:

> Because our kindergarten is near the beach, we already have an adequate A.P.E. (researcher: educational game tools), but children get bored quickly. Usually, we take the kids to the beach. Then APE is made from natural materials we use for children's learning. Children draw on the sand, counting shells. Then there are animals, too, right? Like small crabs, we learn to love God's fellow creatures. The point is that we provide learning for children. We are grateful to God and can preserve what God has given us (AP/Head of AA Kindergarten).

EK added that the teacher taught science concepts about the process of sinking and floating by telling stories of the prophets. "Science learning is also adjusted to Islamic themes." Children learn about sinking and floating when talking about Noah's ship. introducing vehicles that are driven by human power and not human control." (EK/MM Raudhatul Athfal Teacher).

In the introduction to technology learning, RI explained that children had been taught the concept of divinity by being invited to distinguish between humans and God's creations. "More human roles: who made this laptop?" Distinguish between manufactured goods and God's creations. The children were asked to distinguish between pictures containing images of objects created by God and those made by humans. (RI/Head of RF Raudhatul Athfal). Children try to differentiate between humans and God's creation. "Human creation has a lamp; Allah's creation has a sun and a moon." (YE/Head of AF Raudhatul Athfal) AH shared his experience of adding the concept of divinity when teaching cotton-making technology. "The cotton was originally from a plant; it was processed from the kapok plant, and so on until it could become useful cotton; originally from plants, God is the one who grows it."(AH/AP Kindergarten Teacher) AH incorporated Islamic content into the technology practice of utilizing smartphone features. "There was once a communication theme: the practice of making voice notes as a deposit for memorizing prayers." (AH/AP Kindergarten Teacher).

In engineering learning activities, the teacher assigns children to make crafts, which they then link to the concept of divinity. "Children make vehicles using Lego." For instance, a

motorcycle, a car, or a train, and explain which are human and Allah's creations."(MA/MM Raudhatul Athfal, Teacher) AH gave the same explanation: the children learned to make windmills, and the teacher explained that the wind was God's creation. "Relating to windmills, windmills that move are the source of the wind, the wind that creates." All of them ran there, ma'am, so we linked them to Islamic values. (AH/AP Kindergarten Teacher).

In art activities, children are assigned to draw hands, and the teacher relates them to the concept of divinity. "When we trace our fingers, we introduce the hand as God's creation. When a child has a finger that is missing, the teacher explains that "all of God created it." (NA/Head of NA Kindergarten) Furthermore, the concept of divinity is discussed during the color material."In color recognition, children are introduced to the person who created the color." (AN/IP Kindergarten Teacher).

The teacher stated that they had carried out mathematics learning and introduced the concept of divinity in sorting sizes. "It is introduced that a person's height and low are Allah's who created, recognizing height and low, big and small, fat and skinny."(WA/NA Kindergarten Teacher) The concept of divinity is also explained when teaching about the classification of cloud sizes and the process of creating rain. "When the theme was rain, the children were asked to classify large and small clouds. "The relationship with Islamic values is that rain and clouds are God's creations." (RI/RF Raudhatul Athfal, teacher).

Education provides the essential skills humans must possess in the form of thinking and emotional power adapted to the nature of themselves and others. Therefore, education must be accompanied by efforts to direct people to an awareness of Allah SWT as the creator of the universe (Fitriningsih, 2016). Instilling the values of faith and Islam is an effort or action to instill basic religious principles, which are guidelines for religious life. Children's education focuses on improving academically and intellectually and includes all aspects of child development. In addition, the most important things that need to be instilled are religious and moral values. With the education of Islamic values, it is hoped that the regeneration of religious people will occur and develop according to the times and master technology (Fitri, 2018).

Awareness of the existence of a god who created the universe is included in aqidah. Aqidah, defined as belief, can cause the heart and soul to be calm, peaceful, and free from doubt. Islamic aqeedah regulates the relationship between creatures, the creator, and other living creatures (Rosnaeni, 2021). Children must be taught Aqidah from an early age. With the introduction of the concept of divinity at an early age, children become aware of the existence of a creator, understand that God is One and there is no god but Allah, and stay away from associating partners with Allah or shirk. Teachers and parents must teach the planting of aqidah to strengthen the foundation of children's faith. Learning aqidah for children must be adapted to the child's cognitive level and the principles of children's education (Risnawati & Priyantoro, 2021).

With strong faith, children who are intelligent in science can generally become strong figures and become contributors to their environment (Khaerudin, 2014). Teachers need to properly instill the concept of aqidah in children by showing logical arguments and evidence that make sense to them (Khaerudin, 2014). For example, children are taught to be grateful for having a complete and healthy body in learning activities with the theme of the body. On the animal theme, children are taught to admire Allah's creations, like the bee, which is mentioned in the Qur'an because it provides many human benefits. On the theme of food and drink, children are introduced to the concept of heaven, in which the best food and beverages are provided for pious and pious children (Susetyo et al., 2021).

In early childhood education, teachers can teach the concept of divinity in various ways (Nurhayati, 2016). For example, the teacher can lead an exciting song with a beautiful rhythm to introduce the idea of God as the creator and the universe as His creation. Teachers can also take students on field trips, ask about objects in nature and who created them, and invite children to admire the majesty of Allah the Almighty (Herni, 2018).

Using technology media

Islamic Kindergarten/Raudhatul Athfal teachers teach Islamic values using technology and media in STEAM learning. All learning in Islamic Kindergarten/Raudhatul Athfal involved

in this research uses technology and media. In IP Kindergarten and MM Raudatul Athfal, this technology media is prepared by an exceptional team. In contrast, in other Islamic and Raudhatul Athfal kindergartens, it is prepared by their respective teachers.

MM Raudhatul Athfal explained that teachers use technology as a medium for delivering Islamic material, an introduction to reading and writing Al-Qur'an media, both written and audiovisual media. "In the introduction of the YANBU'A Al-Qur'an (read and write the Al-Qur'an), an application can be downloaded so that children know about technology... All Islamic themes are listed in the module, equipped with QR and barcodes, and connected to the Internet. YouTube and Edmodo. (MA/MM Raudhatul Athfal, Teacher) DA memorizes letters and prayers and shows stories of prophets and apostles in his class. "When memorizing using the Murottal VCD and videos about prophet stories, "This technology uses Islamic content but is facilitated through technology." (DA or NA Kindergarten Teacher).

RA, the head of the IP Kindergarten, revealed that a special team made information technology-based media for use in the classroom:

> BTQ is introduced using PowerPoint used in zoom. For example, the one who teaches letters is Mrs. EU, while memorizing short letters uses videos and cards, for instance, by RI. The teacher describes the procedure with pictures and in the form of a PowerPoint, video, etc. Practice prayer using video. Movement follows the video. (RA/Head of IP Kindergarten).

Another thing is that teachers commonly use projector screen technology when watching the story of the Prophet. "It is like connecting with technology." Sometimes they do not get bored, and if we want to watch together, we use the projector. Even though we only see the stories of the apostles, the stories of the apostles' examples, they also teach them about the Prophet's companions and stories about the Prophet. "There is an example to be drawn from it." (IT/AA Kindergarten Teacher).

The use of technology in education is expected in the era of globalization (Lestari, 2018). The utilization and use of information system technology in education is a basic

need for educators and learners (Irmade & Widjanarko, 2019). Regarding the use of technology and media in learning, many parties have tried to build and implement information systems or technology to simplify or improve children's learning experiences. One of these efforts is to create an early childhood e-lesson plan (Gonadi et al., 2021).

Likewise, teachers in kindergarten have tried to improve children's development by using technology and media. Another activity that uses technology as a medium to convey teaching concepts or train memorization is audio-visual learning. It improves the ability to memorize the Qur'an (Aini, 2021). The use of multimedia for learning in the classroom (Febrialismanto & Nur, 2020); making learning videos to be delivered to children in distance learning conditions (Adila & Nurhafizah, 2021); practicing the development of reading skills with interactive multimedia (Putra, 2020); and the use of interactive projectors in learning (Sobiruddin et al., 2019).

The use of technology in learning in the classroom can provide an exciting and memorable experience (Rumianda et al., 2020). Using interactive projectors with on-screen touch input and engaging animations enhances children's enthusiasm. In addition, the teacher responded positively to this interactive projector technology (Sobiruddin et al., 2019). One medium used in distance learning during the COVID-19 pandemic is audiovisual media in the form of learning videos. To increase student involvement in education, the teacher uses storytelling methods, handwork activities, and tasks children must do at home (Adila & Nurhafizah, 2021).

Referring to the Qur'an and Hadith

The teacher teaches Islamic values in STEAM learning by using Al-Qur'an Hadith references. RI, who is the head of RF Raudhatul Athfal, revealed that teachers in Islamic Kindergartens/Raudhatul Athfal are encouraged to be able to connect the science concepts learned by children with verses in the Quran and hadith:

The difference between Raudhatul Athfal is that if the teacher only explains that rain is not associated

with the greatness of Allah or uses Allah's name, Ar-Rahman or Ar-Rahim, the teacher will be the same as general kindergarten teachers. All kindergarten teachers can explain rain, but we must never forget that this rain created God. So, the teacher must always link science learning to the hadith or verses of the Qur'an. For example, when you hear thunder, based on this hadith, the prayer to listen to thunder is... When we speak of rain and fertile soil, we are referring to a creation of Allah, who is the most merciful, and Rahim (gracious), Allah, who is the giver of sustenance and is associated with Asmaul Husna. Sometimes teachers also associate science learning with letters or verses in the Qur'an. So the teacher explains that rain creates a most gracious and merciful God and sustains all of us. We emphasize to the children that everything that happens in nature is made with Allah's permission. (RI/Head of RF Raudhatul Athfal).

Islamic values in the Qur'an and Hadith include glorifying Allah, performing the five daily prayers, staying away from sin, accepting what has happened, and avoiding arrogance. In addition, the teacher can also explain: 1) monotheism, namely faith in Allah and avoiding associating partners with Allah; 2) obedience, filial piety, and respect for parents; 3) awareness of God's presence in every condition of life; 4) how to pray well and rightly; 5) the tendency to follow the commandments of goodness and stay away from sin; 6) patience with life circumstances; 7) humility and not being arrogant and gentle; 8) choosing a balanced attitude that does not lean towards extreme things; 9) self-strength and firm belief; 10) duty as a parent; 11) the desire to learn the Qur'an and Hadith voluntarily; 12) love for Allah, the Messenger, and His Book; 13) Adherence to the Prophet's teachings and examples, 14) an Islamic perspective on life,15) the character, nature, and identity of Islam in oneself, 16) Justice and equality in dealing with other human beings; 17) Pride in being a Muslim (Hayati, 2021).

In early childhood Islamic education, children have the potential to develop their knowledge of Islam (Handayani & Suyadi, 2019). It is one of them since humans are endowed

with a brain that naturally has the potential to recognize God (Montemarano, 2009). Early childhood can be taught about the concept of divinity from the verses of the Qur'an about the universe or the verses of the Kauniyah. In Surah An-Naba, it is explained that Allah created the heavens and the earth, the day and the night, and their benefits for humankind. Children will quickly memorize letters in their brain development, from the womb until age three. In the early stages of forming these brain cells, the number of brain cells develops optimally and continues to grow up to 10 trillion (Epstein, 1986).

Concerning learning materials related to verses in the Qur'an and Hadith, the study of nature must refer to the revelations given to the Prophet Muhammad, PBUH (Purnomo, 2017). For example, sunnatullah, or the natural law that fire has a high temperature, can be used for human purposes such as cooking food. Fire can be created by burning gas with oxygen. Under certain conditions, hot gas with a high temperature can be confined in one room so that the heat does not transfer to other objects (Post et al., 1960). It is also reminiscent of the story of Prophet Ibrahim, who entered the fire and was not burned. It is a mistake to separate spiritual and physical education, religion, and science (Basri, 2019). The lag behind Islamic education is because it has narrowed its meaning to only focus on the afterlife without discussing how life is in the world (Herni, 2018).

In addition to linking learning materials with verses from the Qur'an and Hadith, teachers can also take advantage of stories from the Qur'an and Hadith. Stories originating from the Qur'an and Hadith can provide knowledge, fragments of life experiences, and noble human values. This story method is a set of methods, efforts, and techniques carried out by educators so that students can complete a competency set out in the syllabus (Fauziah & Abdurakhman, 2019).

D. Conclusion

In this study, the learning program in Islamic Kindergarten and Raudhatul Athfal introduce and teach Islamic values in STEAM learning. It is an effort made by teachers and early childhood education institutions to produce prospective

scientists and scholars. The teacher teaches Islamic values in STEAM learning by integrating thematic learning with Islamic nuances and introducing the concepts of monotheism and Islam. Learning Islamic values also relies on technology and media as a learning resource, using text, audio, visual, and audiovisual. In addition, the teacher teaches Islamic values by referring to the Qur'an and Hadith when teaching STEAM material. The researcher concluded that the implementation of STEAM learning containing Islamic values in Islamic Kindergarten/Raudhatul Athfal generally had a similar theme developed into STEAM learning activities.

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References

Adila, M., & Nurhafizah, N. (2021). Learning Implementation Utilizing Audio-Visual Media During the Covid-19 Pandemic in Children in Ekasakti Kindergarten Padang. *EduBasic Journal: Jurnal Pendidikan Dasar*, *3*(2), Article 2. https://doi.org/10.17509/ebj.v3i2.37847

Afridi, M. A. (2013). Contribution of Muslim Scientists to the World: An Overview of Some Selected Fields. *Revelation and Science*, *3*(01), 10.

Aini, A. N. (2021). Daya Guna Media Pembelajaran Audio Visual Dalam Meningkatkan Kemampuan Menghafal Al-Qur'an Pada Anak Kelompok B Di TK Islam Pondok Sakinah. *Jurnal Ilmiah Mahasiswa Pendidikan Agama Islam [JIMPAI]*, *1*(4), Article 4. http://jurnalmahasiswa.umsu.ac.id/index.php/jimpai/article/view/704

Al-Khalili, J. (2010). Science in the Muslim world. *Physics World*,

23(04), 22–25. https://doi.org/10.1088/2058-7058/23/04/30

Amiruddin, A. (2016). Internalisasi Nilai-Nilai Agama Pada Anak Usia Dini Di Raudhathul Atfhal Perwanida 1 Lipu Kabupaten Majene. *Al-Qalam*, *20*(1), Article 1. https://doi.org/10.31969/alq.v20i1.170

Basri, H. (2019). Teologi Sains, Mengatasi Dikotomi Sains-Agama Perspektif Islam. *Zawiyah: Jurnal Pemikiran Islam*, *5*(2), Article 2. https://doi.org/10.31332/zjpi.v5i2.1506

Djollong, A. F., & Akbar, A. (2019). Peran Guru Pendidikan Agama Islam dalam Penanaman Nilai-Nilai Toleransi Antar Ummat Beragama Peserta Didik Untuk Mewujudkan Kerukunan. *Jurnal Al-Ibrah*, *8*(1), 21.

Enah Suminah, Ali Nugraha, Farida Yusuf, Widya A Puspita, & Rahmitha P Soendjojo. (2018). *Kerangka Dasar dan Struktur Kurikulum 2013 Pendidikan Anak Usia Dini*. Direktorat Pembinaan Pendidikan Anak Usia Dini. https://banpaudpnf.kemdikbud.go.id/upload/download-center/Buku%20Kerangka%20Dasar_1554107062.pdf

Epstein, H. T. (1986). Stages in human brain development. *Developmental Brain Research*, *30*(1), 114–119. https://doi.org/10.1016/0165-3806(86)90139-2

Fauzi, A., Badar, R., & Baharun, H. (2019). Analysis Study of Parental Choice of Education in The Millenial Era. *Nadwa: Jurnal Pendidikan Islam*, *12*(2), 311–330. https://doi.org/10.21580/nw.2018.12.2.2904

Fauziah, R., & Abdurakhman, O. (2019). Metode Cerita (Berbasis Cerita Dalam Al-Quran) Pada Pendidikan Anak Usia Dini. *Jurnal Sosial Humaniora*, *4*(1), 34–44. https://doi.org/10.30997/jsh.v4i1.448

Febrialismanto, F., & Nur, H. (2020). Hubungan Aktivitas Penggunaan Teknologi Untuk Pembelajaran Pengembangan Oleh Guru PAUD. *PAUD Lectura: Jurnal Pendidikan Anak Usia Dini*, *3*(02), Article 02. https://doi.org/10.31849/

paud-lectura.v3i02.3886

Fitri, A. (2018). Pendidikan Karakter Prespektif Al-Quran Hadits. *TA'LIM : Jurnal Studi Pendidikan Islam*, *1*(2), Article 2.

Fitriningsih, F. (2016). Urgensi Pendidikan Anak Usia Dini Berbasis Aqidah. *Jurnal Musawa IAIN Palu*, *8*(1), 55–68.

Gloria Julius. (2021). Understanding STEAM in Preschool Classrooms. *Primrose Schools*. https://www. primroseschools.com/blog/understanding-steam-in-preschool-classrooms/

Gonadi, L., Wulandari, R. T., & Desyanty, E. S. (2021). Pelatihan Sistem Informasi Pembelajaran Anak Usia Dini bagi Lembaga PAUD. *Abdimas Pedagogi: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *4*(1), Article 1. https:// doi.org/10.17977/um050v4i1p26-32

Handayani, A. B., & Suyadi, S. (2019). Relevansi konsep akal bertingkat Ibnu Sina dalam pendidikan Islam di era milenial. *Ta'dibuna: Jurnal Pendidikan Islam*, *8*(2), Article 2. https://doi.org/10.32832/tadibuna.v8i2.2034

Hayati, M. (2021). Pengembangan Program Pembelajaran Tematik Berbasis Nilai-Nilai Keislaman untuk TK/RA. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(1), 457–472. https://doi.org/10.31004/obsesi.v6i1.938

Herni, Z. (2018). Pendidikan Agama Islam Pada Paud (Penerapan Pembelajaran Sains Pada Paud). *Edudeena: Journal of Islamic Religious Education*, *2*(1), 20.

Imaduddin, M. (2017). *Mendesain Ulang Pembelajaran Sains Anak Usia Dini yang Konstruktif Melalui STEAM Project-Based Learning yang Bernuansa Islami*. *110*, 9.

Inawati, A. (2017). Strategi Pengembangan Moral dan Nilai Agama Untuk Anak Usia Dini. *Al-Athfal: Jurnal Pendidikan Anak*, *3*(1). http://ejournal.uin-suka.ac.id/tarbiyah/ alathfal/article/view/1422

Irmade, O., & Widjanarko, P. (2019). Pelatihan Pembuatan Media Pembelajaran Berbasis Ict (Information Communication Technology) Di Tk Rumah Pelangi

Colomadu Karanganyar. *Adi Widya : Jurnal Pengabdian Masyarakat*, *3*(1), Article 1. https://doi.org/10.33061/awpm.v3i1.3195

Kemdikbud. (2020). *Statistik Pendidikan Anak Usia Dini (PAUD) 2019/2020*. Publikasi Statistik. http://publikasi.data.kemdikbud.go.id/index.php?thn=all&sek_id=&bpid=&pageNum=4

Khaerudin, K. (2014). Penanaman Pendidikan Aqidah pada Anak Usia Dini. *Madaniyah*, *4*(1), Article 1.

Lestari, S. (2018). Peran Teknologi dalam Pendidikan di Era Globalisasi. *EDURELIGIA: Jurnal Pendidikan Agama Islam*, *2*(2), Article 2. https://doi.org/10.33650/edureligia.v2i2.459

Maeda, J. (2013). STEM + Art = STEAM. *STEAM*, *1*(1), 1–3. https://doi.org/10.5642/steam.201301.34

Major, A. (2018). *What Does Engineering Look Like in Early Childhood?* EiE Blog. https://blog.eie.org/what-does-engineering-look-like-in-early-childhood

Media, K. C. (2020, April 3). *Hadapi Revolusi Industri 4.0, Dunia Pendidikan Harus Bagaimana?* KOMPAS.com. https://www.kompas.com/edu/read/2020/04/03/162000071/hadapi-revolusi-industri-40-dunia-pendidikan-harus-bagaimana

Montemarano, N. (2009). The God Spot. *Ecotone*, *5*(1), 182–201. https://doi.org/10.1353/ect.2009.0011

Muklis, M. (2012). Pembelajaran Tematik. *FENOMENA*. https://doi.org/10.21093/fj.v4i1.279

Munawar, M., & Roshayanti, F. (2020). Penanaman Science Inquiry Skills pada Anak Usia Dini Melalui Story Time Berbantuan KIT STEAM. *Proceeding Seminar Nasional Hasil Penelitian Lembaga Penelitian dan Pengabdian Kepada Masyarakat Universitas PGRI Semarang*, 17. http://conference.upgris.ac.id/index.php/snhp/article/view/1280/878

Nudin, B. (2020). Islamic Education in Early Childhood: Cooperation between Parents and School To Build Character in Disruption Era. *Millah*, *20*(1), 1–32. https://doi.org/10.20885/millah.vol20.iss1.art1

Nurhayati, E. (2016). Penanaman Nilai-Nilai Keislaman Bagi Anak Usia Dini (Studi Kasus Di Ra Al-Ishlah Bobos—Cirebon). *AWLADY: Jurnal Pendidikan Anak*, *2*(2), 22.

Post, R. F., Ellis, R. E., Ford, F. C., & Rosenbluth, M. N. (1960). Stable Confinement of A High-Temperature Plasma. *Physical Review Letters*, *4*(4), 166–170. https://doi.org/10.1103/PhysRevLett.4.166

Prameswari, T. & Anik Lestariningrum. (2020). Strategi Pembelajaran Berbasis STEAM Dengan Bermain Loose Parts Untuk Pencapaian Keterampilan 4c Pada Anak Usia 4-5 Tahun. *Efektor*, *7*(1), 24–34. https://doi.org/10.29407/e.v7i2.14387

Purnomo, S. (2017). Epistemologi Ibnu Khaldun Dan Pengembangan Pendidikan Islam. *Jurnal Ilmiah Mahasiswa Raushan Fikr*, *6*(1), Article 1. https://doi.org/10.24090/jimrf.v6i1.2711

Putra, P. A. (2020). Mengembangkan Kemampuan Membaca Anak Usia Dini Dengan Multimedia Interaktif. *Incrementapedia: Jurnal Pendidikan Anak Usia Dini*, *2*(02), 20–25.

Rahiem, M. D. H., Abdullah, N. S. M., & Krauss, S. E. (2020). Moral Education through Dramatized Storytelling: Insights and Observations from Indonesia Kindergarten Teachers. *International Journal of Learning, Teaching and Educational Research*, *19*(3), 475–490. https://doi.org/10.26803/ijlter.19.3.26

Rahiem, M. D. H., Abdullah, N. S. M., & Rahim, H. (2020). Stories and Storytelling for Moral Education: Kindergarten Teachers' Best Practices. *Journal of Early Childhood Education (JECE)*, *2*(1), 1–20. https://doi.org/10.15408/jece.v2i1.15511

Rahiem, M. D. H., Fitri, A., & Faeruz, R. (2022). Video Pembelajaran dan Lembar Kerja pada Pembelajaran Anak Usia Dini

Selama COVID-19. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *6*(5), Article 5. https://doi.org/10.31004/obsesi. v6i5.2435

Rahiem, M. D. H., & Novi, A. (2022). Home Visit Sebagai Metode Pembelajaran Anak Usia Dini Pada Masa COVID-19. *As-Sibyan: Jurnal Pendidikan Anak Usia Dini*, *7*(1), Article 1. https://doi.org/10.32678/as-sibyan.v7i1.5710

Rahmawati, R., & Sumedi, S. (2020). Pendidikan Nilai Agama Dan Moral Anak Melalui Kegiatan Bermain Sains. *WISDOM: Jurnal Pendidikan Anak Usia Dini*, *1*(2), 95–129. https:// doi.org/10.21154/wisdom.v1i2.2375

Risnawati, A., & Priyantoro, D. E. (2021). Pentingnya Penanaman Nilai-Nilai Agama Pada Pendidikan Anak Usia Dini Dalam Perspektif Al-Quran. *As-Sibyan: Jurnal Pendidikan Anak Usia Dini*, *6*(1), Article 1. https://doi.org/10.32678/as-sibyan.v6i1.2928

Rosnaeni, N. (2021). Pendidikan Aqidah, Ibadah, Akhlak untuk Anak Usia Dini di PAUD X, Taam Y, Pos PAUD Z, TK A Muhammadiyah Cianjur. *Jurnal Riset Pendidikan Guru Paud*, *1*(1), Article 1. https://doi.org/10.29313/jrpgp.v1i1.14

Rumianda, L., Soepriyanto, Y., & Abidin, Z. (2020). Gamifikasi Pembelajaran Sosiologi Materi Ragam Gejala Sosial sebagai Inovasi Pembelajaran Sosiologi Yang Aktif dan Menyenangkan. *JKTP: Jurnal Kajian Teknologi Pendidikan*, *3*(2), Article 2. https://doi.org/10.17977/um038v3i22020p125

Rustam, A., Fitri, S., & Hidayat, D. R. (2021). Deskripsi tahapan perkembangan keimanan berdasarkan teori James. W. Fowler. *TERAPUTIK: Jurnal Bimbingan Dan Konseling*, *5*(1), 109–114.

Sandra M Linder Angela Eckhoff. (2020). *Breaking Down STEAM for Young Children*. NAEYC. https://www.naeyc.org/resources/pubs/tyc/feb2020/breaking-down-steam

Sari, D. Y., & Rahma, A. (2019). Meningkatkan Pemahaman Orang Tua dalam Menstimulasi Perkembangan Anak dengan Pendekatan STEAM Melalui Program Home Visit.

Jurnal Tunas Siliwangi, *5*(2), 14. https://doi.org/10.22460/ts.v5i2p93-105.1566

Sayuti, W., & Rahiem, M. D. H. (2020). A Comparison of Science Integration Implementation in Two State Islamic Universities in Indonesia. *Madania: Jurnal Kajian Keislaman*, *24*(1), Article 1. https://doi.org/10.29300/madania.v24i1.3293

Slamet, S. (2020). Stimulasi Perkembangan Anak Usia Dini melalui Kegiatan Mewarnai dan Hafalan Al Quran. *Warta LPM*, *24*(1), 59–68. https://doi.org/10.23917/warta.v24i1.9917

Sobiruddin, D., Dwirahayu, G., & Kustiawati, D. (2019). Pengembangan Media ICT Berbasis Proyektor Interaktif Bagi Guru dan Siswa Raudhathul Athfal (RA). *Edcomtech: Jurnal Kajian Teknologi Pendidikan*, *4*(1), Article 1. https://doi.org/10.17977/um039v4i12019p008

Susetyo, B., Gatot, M., & Royani, I. (2021). *Model Pembelajaran Sains Dan Matematika Pada Anak Usia Dini Menggunakan Pendekatan Melesat Dan Teknik Loose Parts*. *6*(1), 9.

Suyatno, S. (2015). Integrated Islamic Primary School In The Middle-Class Muslims Indonesia Conception. *Analisa*, *22*(1), 121. https://doi.org/10.18784/analisa.v22i1.148

UU No. 14 Tahun 2005 tentang Guru dan Dosen. (2005). https://peraturan.bpk.go.id/Home/Details/40266/uu-no-14-tahun-2005

Wahyuningsih, S., Nurjanah, N. E., Rasmani, U. E. E., Hafidah, R., Pudyaningtyas, A. R., & Syamsuddin, M. M. (2020). STEAM Learning in Early Childhood Education: A Literature Review. *International Journal of Pedagogy and Teacher Education*, *4*(1), 33. https://doi.org/10.20961/ijpte.v4i1.39855

Watini, S. (2019). Strategi Pembelajaran Nilai-Nilai Agama di Raudhatul Atfal Assu`Ada Cijerah Bandung. *Alim | Journal of Islamic Education*, *1*(1), Article 1. https://doi.org/10.51275/alim.v1i1.120

Zubaidah, S. (2019). STEAM (Science, Technology, Engineering, Arts, and Mathematics): Pembelajaran untuk Memberdayakan Keterampilan Abad ke-21. *Proceeding Seminar Nasional Matematika dan Sains dengan Tema "STEAM Terintegrasi Kearifan Lokal dalam Menghadapi Era Revolusi Industri 4.0,"* 19.