Embedding STEM Learning with Islamic Values and Character Education in the Storybook

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Abstract

This article aimed to describe a combination between Science, Technology, Engineering, and Mathematics (STEM) learning with religious character while respecting diversity in the story book. This research is part of the research method of designing and developing picture storybooks at the ADDIE model's analysis, design, and development stages. Prototype Design *STEM Activity Storybook* shows how the picture of project-based learning is implemented. In this storytelling, students can learn how to interact with different tribes, nations, races, and religions to solve environmental problems. In the storybook, there are trigger questions *Higher Order Thinking Skills* (HOTS) to be discussed in discussions and STEM-*Engineering Design Process* (EDP). The purpose of developing this book is to illustrate how to combine STEM learning and character education in story books.

Keywords: STEM Learning, Character Education, Pancasila Student Profile, Diversity, Islamic Values

INTRODUCTION

Changes that occur globally with advances in information technology do not necessarily directly impact improving the quality of education. The quality of education in Indonesia is still below the minimum standard of ability in science, mathematics, and reading, which shows that students in Indonesia are still below the minimum standard of ability from the study results *in the Programme for International Student Assessment* 2018 (PISA)(Hewi & Shaleh, 2020). Educational disparities between regions and the lack of ability of teachers to stimulate analytical skills and *Higher Order Thinking Skills* (HOTS) is the main factor for low literacy in Indonesia (Ministry of Research, Technology and Higher Education Indonesia., 2021a).

Looking at the low literacy of generation z, even though information and reading sources are at hand (a.k.a. Mobile Devices), the government of the Republic of Indonesia is implementing several efforts to increase student literacy by promoting the National Literacy Movement program (Hastuti et al., 2021), changing the National Examination into a National Assessment (Ministry of Education, Culture, Research, and Technology of the Republic Indonesia, 2021b), Carrying out the Indonesian Madrasah Competency Assessment as a program of the Ministry of Religius and the World Bank (Agustina, 2021), and changing the

curriculum 2013 into a Independent curriculum to create learning characteristics that support improving PISA study results as an assessment of student literacy measurement Ministry of Education, Culture, Research, and Technology of the Republic Indonesia, 2022a).

Learning Science, Technology, Engineering, and Mathematics (STEM) is an initiative of various countries (Li et al., 2020) to improve 21st-century thinking skills (Häkkinen et al., 2017). STEM learning developed in the United States aims to develop 21st-century skills, namely critical thinking, creative thinking, communicating, and collaborating to solve problems (Gandi et al., 2019), so John Dewey's philosophy of thought is the basis for implementing STEM learning. He argues that education must start with solving real-world problems and interacting with society by integrating various fields of knowledge (Corlu et al., 2014; Crippen & Archambault, 2012; Glancy & Moore, 2013). The success of STEM learning in developing 21st-century skills has made STEM learning develop in various countries, including Indonesia (Arlinwibowo et al., 2020; Farwati et al., 2021). Regarding John Dewey's philosophy, a suitable STEM learning approach is *Project Based Learning* (Capraro et al., 2013; Gandi et al., 2019; Safiee et al., 2018). STEM learning can be applied refers to models of the *Engineering Design Process* (EDP) with the syntax of asking, imagining, planning, implementing, testing, and developing (Haik et al., 2015; Hynes et al., 2011; Lin et al., 2021; Lottero-Perdue et al., 2016; Nulhakim & Setiawan, 2021).

STEM learning focuses on solving student-centered problems collaboratively to improve critical thinking and creative thinking (Capraro et al., 2013; Hanif et al., 2019; Ng & Adnan, 2018) And necessary to be applied in developing students' reading literacy, numeracy, and science literacy (Roungos et al., 2020). In addition, at the same time, STEM learning, which is identical to collaborative problem-solving learning, can introduce students to noble character and diversity so that all dimensions of the Pancasila Student Profile can be applied in STEM learning projects.

STEM learning with a project-based approach has a role in integrating STEM with other disciplines. *Project Based Learning* (PjBL) with an environmental perspective can be integrated with Islamic values (Farida et al., 2017) and combined with learning Arabic (Harun, 2020). In STEM learning that is collaboratively to solve problems, the focus of teacher assessment can also include how the dynamics of students collaborate. Teachers can assess how students can work together in working group conditions diverse in gender, ethnicity, nation, and religion. Students can also learn to interact with sources outside the school to gather information to solve problems. Through this attention, the teacher can assess the development of each Pancasila Student Profile sub-element according to the phase

(Ministry of Education, Culture, Research, and Technology of the Republic Indonesia, 2022b).

However, not all learning conditions can provide the same experience. For example, in religion-based schools or madrasahs, more students are in a homogeneous environment, so they do not experience learning themselves, which can directly practice the experience of diversity in learning in schools, so media is needed that can provide an overview of STEM project-based learning experiences, namely through picture story books.

Picture storybooks are commonly used in various schools with disparities in facilities and infrastructure for teaching materials and learning media in Indonesia. Apart from being enjoyable for students to read independently, this book can be used in class and with parents at home. Reading picture storybooks is also a gateway for students' interest in reading and facilitating reading comprehension (Flack et al., 2018). As the initial gateway to children's reading literacy skills, storybooks can also exemplify a value (Cheung et al., 2017). Through this storybook, researchers seek to develop and combine STEM learning with character content that respects religion and religiosity through Pancasila.

There are findings that STEM and STEAM (Science, Technology, Engineering, Art, and Mathematics) learning can be applied through picture story books, especially for children aged 1-8 years (Hintz et al., 2020; Ruzzi et al., 2017; Setyowati et al., 2021; Sullivan & Strawhacker, 2021) and for elementary schools (Cardullo & Burton, 2022; Tank et al., 2013). The book "If I Built a House" by Chris Van Dusen tells how children can imagine the design of their dream house with the Engineering Design Process (Sullivan & Strawhacker, 2021). In addition, it has been introduced how the form of storybooks contains STEM learning that emphasizes social justice, EDP and integrates mathematics with science (Malone et al., 2017). However, no product prototype has yet been found that embeds Pancasila Student Profiles with Islamic nuances with STEM learning.

The dimensions of the Pancasila Student Profile can be developed to foster gratitude and connect religious values with phenomena that occur in the environment. At the same time, the social aspect can be described in products to develop global diversity and cooperation by narrating and illustrating the existence of cooperation and mutual assistance in diversity in solving problems. HOTS elements, namely critical and creative thinking, are integral to STEM learning, so there are cognitive challenges to training critical reasoning and creativity in story books. Thus this article will describe the design process for developing picture storybooks filled with STEM learning, religious character education, and respect for diversity at the elementary school/Madrasah Ibtidaiyah level.

Integration Islamic Values With Science

Linking the contents of the Qur'an with science is a hot topic of discussion today. The debate among scholars begins with which comes first: 1) Scientific understanding is justified in the Al-Qur'an, or 2) Al-Qur'an understanding is to encourage scientific research? Gusmian says the first is the most dominant (Muchlisin & Nisa, 2017). Muchlisin & Nisa (2017) explains that there are three groups of scholars in addressing the relationship between science and the Qur'an: 1) The advocates' group argues that the tradition of scientific interpretation has long been in Islamic literature and according to Imam Al-Ghazali, the interpretation of several verses of Al-Qur'an -The Qur'an cannot be understood by a historian but by a knowledgeable scientist. 2) the rejectionist group, namely al-Syatibi, Muhammad Husain al-Zahabi, Muhammad Izzat Darwaza, Bint al-Syathi, Subhi al-Shalih, and Mahmud Syaltut. According to Mahmud Syaltut, science is changing and dynamic, but Al-Qur'an will remain the same throughout the ages. 3) Moderate groups, namely Hasan al-Banna, Muhammad Abdullah Draz, and Sayyid Qutb, argue that connecting science with the Qur'an must go through general interpretation rules and only refer to scientific facts, not scientific theories.

Even though there is resistance to connecting religion with science from scholars and Western thinkers, according to Golshani, the link between science and the Qur'an is very relevant today to what is happening on earth due to being separated between religion and science (Golshani, 2020). Many scientific thinkers have tried to separate religion from science all this time. Not so with Golshani's thinking as a thinker and a physicist. According to him, finding scientific products is an effort to get closer to Allah as a God, increase understanding of God, and serve as a human guide to face life's challenges (Thoyib, 2013). He also argues that so far, the thought of separating religion from science has only led to the destruction of civilization (Golshani, 2020).

The Ministry of Religion of the Republic of Indonesia, from 2009 to 2015, developed various books of scientific interpretation to bridge the gap between Islam and science, named Tafsir Ilmi (Faizin, 2017). The objectives of developing Scientific Interpretation are:

a. It is Cultivating transcendental values between science and religion to strengthen people's belief in the greatness of Allah.

a. To keep the axiology of science based on Islamic values,

a. Providing a knowledge base that the integration of science and Islam can be a reference for modern knowledge and technology.

Pancasila Student Profile Element And Sub-Element

The Pancasila Student Profile is an embodiment of Indonesian students as lifelong learners with global competence and behavior following Pancasila values (Ministry of Religius Affairs of the Republic of Indonesia, 2022a). Pancasila Student Profile is a character ability and competency that must be owned by every Indonesian student in the 21st century. Formulation of Pancasila Student Profile: Indonesian students are lifelong students who have character, are competent, and behave under the values of the Pancasila precepts (Irawati et al., 2022).

According to the Ministry of Education and Culture, Pancasila Student Profile, six profiles are core competencies in creating students with a Pancasila spirit, among others: 1) faith, devotion to God Almighty and noble character, 2) independent, 3) critical thinking, 4) creative, 5) cooperation, and 6) global diversity(Kurniawaty & Faiz, 2022).

The following are the main features of the Pancasila Student Profile:

1.   Fear God and have a noble character.

Indonesian students who have faith, fear of God, and noble character are students who have good morals to God Almighty. He understands the teachings of his religion and belief and applies this understanding in his daily life. There are five key elements of having faith, fear of God, and having a noble character: (a) religious character; (b) personal morals; (c) morals to humans; (d) morals towards nature; and (e) state morality. In this case, it is hoped that students can become adherents of a devout religion by not degrading followers of other religions (Safitri et al., 2022).

Based on the Decree of the Head of the Education Standards, Curriculum, and Assessment Agency, Ministry of Education, Culture, Research and Technology, Pancasila Student Profile, in the Independent Curriculum, it is known that there are derivatives from the dimensions of faith, piety, and noble character, namely elements: (a) religious morals; (b) personal morals; (c) morals to humans; (d) morals towards nature; and (e) state morality. In addition to each phase, there are also several tertiary sub-elements (Ministry of Education, Culture, Research, and Technology of the Republic Indonesia, 2022).

For phase, A sub-elements, namely class 1 and 2 Elementary School/Islamic Elementary School, the sub-elements for each element in this dimension are:

Table 1. Elements and Sub-elements of Phase A (6-8 years) on the Dimensions of Faith, Piety, and Noble Morals.

Elements	Sub-element
Elements of religious	Knowing and Loving God Almighty: Knowing the main attributes of God Almighty that He is the Most Loving and Compassionate Creator and

Elements	Sub-element
morals	recognizing his goodness as a reflection of God's nature.
	Understanding Religion/Belief: Knowing the main elements of religion/belief (teachings, religious rituals, scriptures, and saints/messengers of God YME)
	Implementation of Worship Rituals: Accustomed to performing worship according to religious teachings/beliefs
Elements of Personal Morals	Integrity: Recognizing the things that are similar and different in various ways and responding positively.
	Empathize with others: Empathize with others: Identify the emotions, interests, and needs of those closest to you and respond positively to them.
Moral elements of nature	Understanding the Connectedness of Earth's Ecosystems: Identifying God's various creations.
	Protecting the Surrounding Natural Environment: Get used to being grateful for the natural environment around you and practicing taking care of it.
Moral elements of religion	Carrying out Rights and Obligations as Indonesian Citizens: Identifying their rights and responsibilities at home, school, and the surrounding environment and their relation to faith in God Almighty.

2. Global Diversity

Indonesian students maintain their noble culture, locality, and identity and keep an open mind in interacting with other cultures, thereby fostering a sense of mutual respect and the possibility of developing a positive, non-noble, culturally noble culture. Elements and keys to global diversity include knowing and appreciating culture, intercultural communication skills in interacting with others, and reflection on and responsibility for the experience of diversity.

Table 2. Elements and Sub-elements of Phase A (6-8 years) on the Global Diversity Dimension.

Elements	Sub-elements
Elements of Knowing and appreciating culture	Exploring culture and cultural identity: Identifying and describing ideas about himself and several groups in the surrounding environment.
	Exploring and comparing cultural knowledge, beliefs, and practices: Identifying and describing one's daily practices and culture.
	Growing respect for cultural diversity: Describe the experience and understanding of living together in diversity.
Elements of Communication and interaction between cultures	Communicating across cultures: Recognizing that self and others use words, images, and body language with different meanings in the surrounding environment.
	Considering and cultivating multiple perspectives: Expressing views on common topics and listening to different points of view in the family and school environment.
Elements of Reflection and Responsibility for the Experience of Diversity	Reflection on the diversity experience: Mention what has been learned about other people from their interactions with cultural diversity in the school and home environment.

Elements	Sub-elements
	Eliminate stereotypes and prejudice: Recognize the differences in each person or group and react to them as fair.
	Aligning cultural differences: Identifying concrete cultural differences in the surrounding environment.
Elements of Social Justice	Actively building an inclusive, just, and sustainable society: Making friends regardless of differences in religion, ethnicity, race, gender, and other differences, and getting to know social, economic, and environmental problems in the surrounding environment.
	Participate in shared decision-making processes: Identify options based on own and others' needs when making decisions.
	Understanding the role of the individual in democracy: Identifying the roles, rights, and obligations of citizens in a democratic society.

3.   Working Together.

Indonesian students can work together voluntarily so that the activities run smoothly and can run smoothly. The elements of cooperation are collaboration, caring, and sharing.

Table 3. Elements and Sub-elements of Phase A (6-8 years) on the Mutual Cooperation Dimension.

Elements	Sub-elements
Collaboration Elements	Cooperation: A person can Accept and carry out the group's tasks and roles in a joint activity.
	Communication to achieve common goals: Understanding simple information from others and conveying simple information to others using their own words.
	Positive interdependence: Recognizing needs that require others to fulfill them.
	Social coordination: Carry out group activities by mutual agreement with guidance, and remind each other of the agreement
Elements of Concern	Responsive to the Social Environment: Be sensitive and appreciate the people in the environment, then take simple actions to express it.
	Social perception: Recognizing various reactions of other people in the surrounding environment and their causes.
Sharing Element	Give and receive things considered valuable and important to/from people in the environment.

4.   Creative

Creative students can modify and produce something original, meaningful, useful, and impactful. The key element of creativity consists of generating original ideas and producing original works and actions.

Table 4. Elements and Sub-elements of Phase A (6-8 years) on the Creative Dimension

Elements	Sub-elements

Elements	Sub-elements
Elements generate original ideas	They can turn several ideas into meaningful imaginative ideas or ideas to express thoughts and feelings.
Elements produce original works and actions.	Explore and express thoughts or feelings through words and actions and appreciate the resulting works and actions.
Elements have the flexibility of thinking in finding alternative solutions to problems.	Identify creative ideas to deal with situations and problems.

5. *Critical Reasoning*

Students who reason critically can objectively process, qualitatively and quantitatively, build links between various information, analyze information, and evaluate and conclude it. The elements of critical reasoning are obtaining and processing information and ideas, analyzing and evaluating reasoning, reflecting on thoughts and thought processes, and making decisions.

Table 5. Elements and Sub-elements of Phase A (6-8 years) on the Critical Reasoning Dimension.

Elements	Sub-elements
Elements of obtaining and processing information and ideas	Asking questions: To answer his curiosity and identify a problem about himself and his environment.
	Identify, clarify, and process information and ideas: Identify and process information and ideas.
Elements analyze and evaluate reasoning and procedures	Elements of analyzing and evaluating reasoning and its procedures: Performing concrete reasoning and providing reasons in solving problems and making decisions.
Elements of thought reflection and thought processes	Reflecting and evaluating his thoughts: Expressing what is being thought in detail.

6) *Independent*

Indonesian students are independent students, namely students who are responsible for their learning processes and outcomes. The key elements of independence consist of self-awareness, the situation one is facing, and self-regulation. Implementing Pancasila Student Profile can make students not dependent on others in their energy, thoughts, and time to realize their hopes and aspirations (Andriani, 2022).

Table 6. Elements and Sub-elements of Phase A (6-8 years) on Independent Dimensions.

Elements	Sub-elements
Elements of Self-understanding and the Situation at Hand	Recognizing personal qualities and interests and the challenges faced: Identifying and describing abilities, achievements, and subjective interests.

Elements	Sub-elements
	Developing self-reflection: Reflecting to identify strengths, weaknesses, and achievements.
Elements of Self-Regulation	Emotion regulation: Identify the emotions one feels and the situations that cause them, and express them fairly.
	Setting learning goals, achievements, self-development, and strategic plans to achieve them: Setting learning targets and planning the time and learning actions to be carried out.
	Shows initiative and works independently: Takes initiative to carry out routine tasks independently under adult supervision and support.
	Develop control and self-discipline: Carry out learning activities in class and complete assignments within the agreed time.
	Confident, tough (*resilient*), and adaptive: Dare to try and be adaptive in facing new situations and persist in completing the agreed tasks.

Rahmatan lil Alamin Student Profile

In addition to the Pancasila Student Profile, some values must be instilled in Muslim students initiated by the Ministry of Religion, namely the value of religious moderation, which includes: 1. Civilized (tamandua); 2. Exemplary (Judah); 3. Citizenship and Nationality (muwaṭanah); 4. Taking the middle way (tawassuṭ); 5. Balanced (tawazun); 6. Straight and Firm (I'tidal); 7. Equality (musāwah); 8. Deliberation (shura); 9. Tolerance (tasāmuh); 10. Dynamic and innovative (taṭawwur wa ibtikār).

This value of religious moderation is a student profile of Rahmatan Lil Alamin, a guide in developing co-curricular (Ministry of Religius Affairs of the Republic of Indonesia, 2022b). The value of religious moderation is developed so that students become students who are a blessing to all humanity. Can maintain traditions and sow friendly and moderate religious ideas in Indonesia's diversity without uprooting existing traditions and culture based on human values (Ministry of Religius Affairs of the Republic of Indonesia, 2022c).

METHOD

This method is an essential part of development research with the ADDIE model (*Analysis, Design, Develop, Implementation, and Evaluation*) (Aldoobie, 2015), namely at the analysis, design, and development stage. In this section, the researcher applies various results of the analysis of the literature into the prototype design,1) Analyzing the needs of Islamic Elementary School teachers regarding the development of story books, 2) analysis of the dimensions of the Pancasila Student Profile as the goal of forming the character of students through an independent curriculum; 3) Characteristics of STEM learning; 4) Criteria for developing story books for children (Trimansyah, 2020).

RESULTS AND DISCUSSION

Analysis Phase

The research was conducted at two Private Islamic Elementary Schools in Sidoarjo Regency, East Java Province. The reason for collecting data on Private Islamic Elementary Schools is to determine how Private Islamic Elementary School teachers view STEM learning so that it allows STEM learning to occur in the school. It should be noted that private Private Islamic Schools or Madrasahs have limited access to the Ministry of Education and Culture's program, so the speed of adapting to the new curriculum is different from that of elementary schools. In addition, the school's position is in the Regency, which has different adaptability from the city in disseminating the new curriculum, so there is a gap between the Capital City of West Java. To adapt to the new curriculum, teachers at Madrasahs need to learn more actively about issues that are developing in the world of Indonesian education. In addition, in contrast to public schools, funding for school activities relies more on students, who, on average, are filled by the lower middle class (Syaifudin & others, 2021), so school funding relies heavily on School Operational Assistance funds.

Private Madrasahs face many challenges in preparing students for life in a fast-paced modern society and the emerging global knowledge economy. With management that is still traditional in private madrasas, it impacts the weakness of teaching teacher resources. Madrasas have designed alternative efforts by borrowing teachers from public madrasas with a part-time work system to meet teachers' quality. Quality schools need professional teachers who work according to their fields and adequate facilities (Syaifudin & others, 2021).

The magnitude of the challenges faced by private Islamic Schools is facing a paradigm shift in welcoming curriculum changes, so this research was conducted at Private Islamic Elementary Schools to determine the readiness of these schools to face the new curriculum. Suppose teachers have started to understand and are open to seeing curriculum changes. In that case, apart from Private Islamic Elementary Schools, the book developed can be accepted and applied in public and private islamic primary schools with adequate resource capacity and facilities.

The development of project-based learning media to strengthen the profile of Pancasila students and STEM learning needs to refer to how islamic primary school teachers understand the importance of implementing this learning in schools so that the existence of this storybook becomes important and can be applied in schools. Below is a list of interview questions for

Islamic Elementary School teachers regarding STEM learning and its relationship with the Independent Curriculum:

1) What do you know about project-based learning, currently planned as part of the independent curriculum?

2) In your opinion, is STEM learning part of project-based learning? Can you explain?

3) In your opinion, are the STEM learning steps the same as project-based learning steps? Can you explain?

4) In your opinion, what are the specialties of STEM learning compared to project-based learning?

5) What do you know about the need for skills for education in the 21st century?

6) If you need help understanding the project learning process and the STEM learning process, do you feel the need to study it for the needs of students? Why?

7) Are there any instructional media that can assist in implementing STEM learning, such as electronic media or printed media, suitable for application in your school? Why?

8) Can storybooks filled with STEM learning help you understand the STEM learning process and help apply it in classroom learning? Explain!

9) In your opinion, is STEM learning effective for students in grade 2 or 3 MI?

10) Can schools facilitate teachers to apply STEM learning if they adapt to the Independent Curriculum?

Six teachers had received training on the Independent Curriculum and were interviewed for the needs of preliminary analysis. Of the total teachers, three are honorary teachers, and three are certified teachers. Of the six teachers, only one senior honorary teacher needed to understand STEM learning, so almost all teachers understand STEM learning. In addition, all teachers can analyze the relationship between STEM learning and project-based learning. They all respond to the importance of STEM learning and media supporting STEM learning. In addition, the two schools fully facilitate the implementation of STEM learning.

From the results of the interviews, the understanding of MI teachers towards curriculum changes, both those who are certified and those who are not yet, is very positive, and they are trying to learn and implement them in madrasas. In addition to the efforts of teachers to try to understand project-based learning and STEM learning, schools also provide funds to make this program successful.

Based on the results of the preliminary analysis, it is known that the teachers have a positive attitude towards STEM learning, so this storybook will likely be implemented in

Elementary Schools/Islamic Elementary Schools as a means for teachers to learn more about STEM learning, and STEM learning media which can also train student literacy.

In practice*, Islamic STEM Activity Storybook* can provide teachers with an overview of how STEM project-based learning can be applied in the learning environment through storytelling and characterizations. In addition, this book can provide an overview of how the steps Engineering Design Process (EDP) STEM can be understood (Metafisika et al., 2022) and interesting to learn in class with the teacher or independently at home (Azis et al., 2022).

Design and Development Phase.

In the design process, planning is implemented until the manufacture of product prototype development by explaining the process and results of the preliminary study. The process design phase *brainstorming* involves the factors and references involved in the idea generation process and the *STEM Activity Storybooks* prototyping phase.

In the development of the storyboard, elements that meet the fulfillment of Learning Outcomes, Fulfillment of Pancasila Student Profile elements, as well as STEM Learning elements in story books are mapped so that it can be concluded that the contents of the book can have content that can provide insight into STEM learning and Pancasila Student Profile. The storyline in the book describes a project-based learning process to solve environmental problems. All elements of the Pancasila Student Profile and STEM elements can be contained in the book's storyline and its characterizations.

Next is developing character characteristics and storylines containing Pancasila Student Profile and STEM Learning. The storyline development is applied with the illustration design to be part of the prototype evaluation before the validation stage.

In the development stage, the overall characterization and storyline, STEM-laden activities, and STEM learning are poured into the storyline. Deep storyline *Islamic STEM Activity Storybooks* Demonstrates the process of simulating project activities for strengthening the Pancasila Student Profile with the following steps: 1) Formulation of problems by students as figures, 2) Search for ideas by students as figures, 3) Making designs and implementation with the help of teachers or experts by learning principles project-based(Rachmawati et al., 2022). Furthermore, STEM content and STEM learning with models *of the Engineering Design Process* (EDP)(Haik et al., 2015) are applied in implementing the Strengthening Pancasila Student Profile Project solution to obtain the relationship scheme shown in Figure 1.
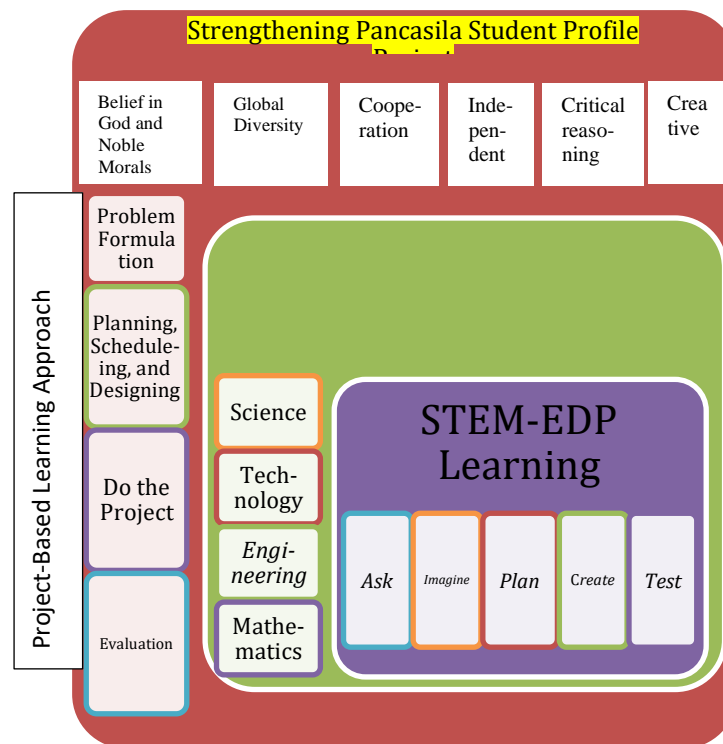
Figure 1. The Relationship Between STEM Learning in the Strengthening Pancasila Student Profile Project

Based on Figure 1, it can be concluded that STEM learning trains skills and adds knowledge to support skills and character building in the Strengthening Pancasila Student Profile Project.

STEM Activity Storybooks entitled "Mari Mengolah Sampah bersama Arsya", tells the story of three students with different religious, racial, and ethnic backgrounds playing together and finding problems that occur around their homes. Furthermore, they find out the problem's source through their schoolteachers. After they get enlightened from the discussion results, they gather again to find solutions to solve the problem. The problem is that the river is dirty, smelly, and garbage. They find out the source of the problem by asking teachers at school and analyzing what types of waste make the river dirty and smelly. Based on the type and material, they are looking for ways to reduce the negative impact of waste and waste through *reduc*tion and *recycl*ing.

This process is a step in implementing the Strengthening Pancasila Student Profile Project. Project-based learning begins with students formulating problems and continuing with the search for ideas and ideas to solve problems initiated by students with the help of adults, both teachers and experts, as facilitators. Students can also seek information from

various sources to find solutions to problems that arise(Gianistika, 2022). All this is done in collaboration through students' creative and critical thinking directed by adults.

Through this story description, it is hoped that students and teachers can examine how the project-based learning process works because it is known that storytelling can improve understanding of a concept(Arditama et al., 2018; Koskinen et al., 1988; Morrow, 1984; Novasyari, 2018).

Yuk Kita Refleksikan!

1. Menurutmu apakah sikap mereka dengan memilih ketua untuk menyelesaikan proyek adalah tindakan yang tepat? Mengapa?

2. Apakah memilih Ni Putu sebagai ketua kelompok adalah tindakan yang tepat? Mengapa?

3. Apa tindakan yang harus dilakukan Michael dan Arsya setelah Ni Putu ditunjuk sebagai ketua kelompok?

4. Apa tindakan yang harus dilakukan oleh Ni Putu sebagai ketua kelompok?

5. Sesuai dengan sila ke berapa tindakan Arsya dan teman-teman di atas?
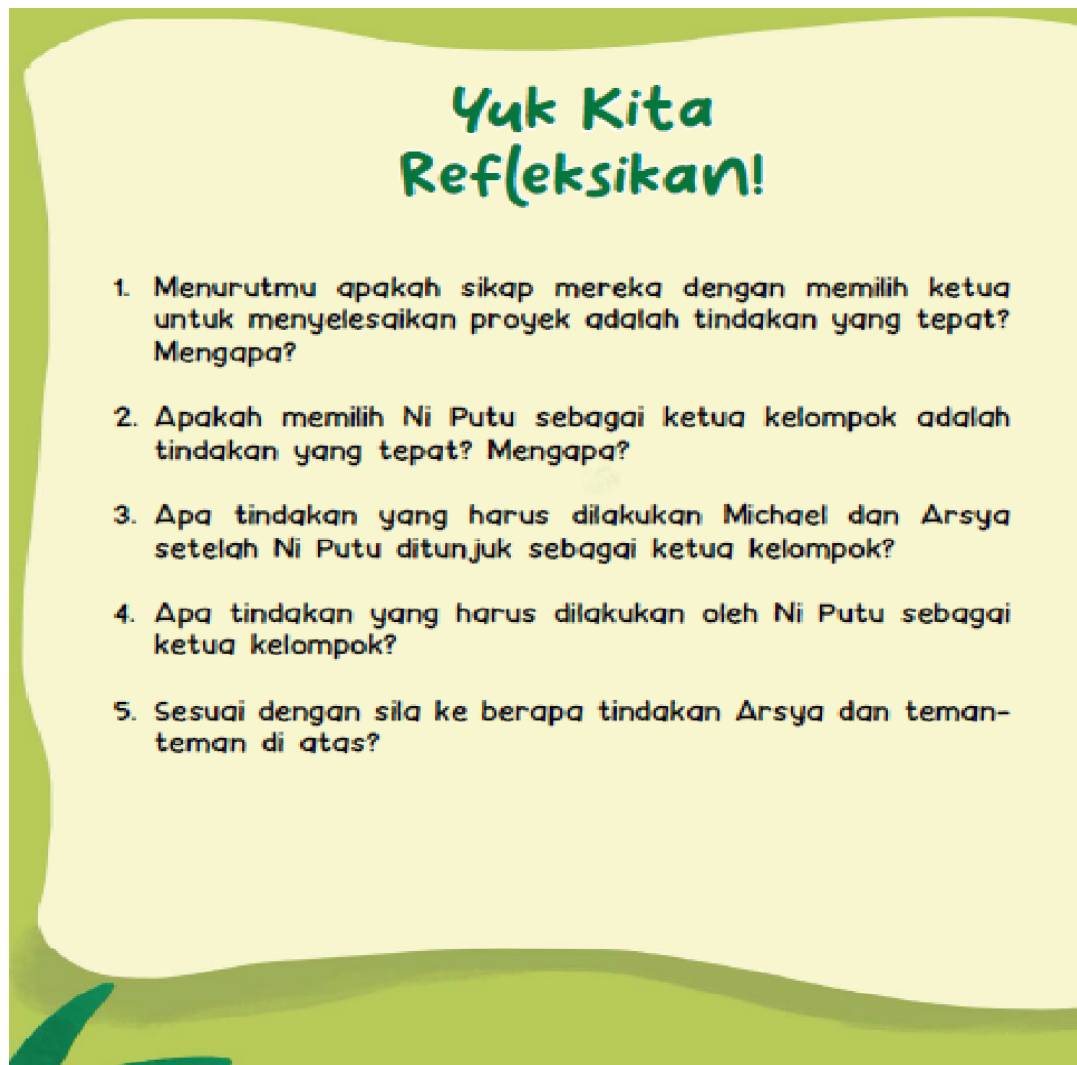
Figure 2. HOTS Questions to Evaluate Actions that Reflect Diversity and Democracy

Figure 2 shows a question inviting students to assess the actions of Michael, Arsya, and Ni Putu that reflect Pancasila values. In this question, students can give their opinion about the democratic process in the small group of Arsya, Michael, and Ni Putu regarding the values of global diversity and cooperation.

In this section, readers are invited to criticize and reflect through the application of Pancasila on what Arsya and his friends have done to solve problems. It aligns with a study initiated by Blackmore (2016) on implementing global citizenship education lessons through

critical thinking, dialogue, and reflection. Through dialogue-oriented storytelling, participants can develop self-esteem and a critical disposition to learn civic identity (Chan, 2019).

Figure 3. Students are invited to be creative in making something new with used goods
to develop creativity

In Figure 3, students are invited to think creatively to create something new from used goods. It is under HOTS, namely, being creative. Readers are invited to explore their knowledge to create something new through brainstorming to solve problems (Conradty & Bogner, 2018). From the findings, it is known that applying brainstorming can improve creative problem-solving skills. This brainstorming is part of the EDP step, namely ideate (Cinar, 2019; Haik et al., 2015).

Figure 4. Explanation of Liquid Waste's Impact on Water Ecosystems and Its Relationship with Values in the Qur'an

Islamic values in storybooks with STEM content can be raised through wisdom from events or problems raised in storybooks. In the prototype of this book, the lesson is that God hates human actions that can be bad for the environment. Factories, plastics, motorized vehicles, and artificial fertilizers are manufactured to make human life easier, but if the environmental impact is not considered, it will destroy human life. Along with Gholsani's thought that separating religion from science will destroy civilization (Golshani, 2020; Hidayatullah, 2018; Rifenta, 2019). The purpose of linking Islamic values (what and why) with environmental issues can provide insight so that Muslims can change their behavior towards environmental sustainability (how) (Abdelzaher et al., 2019). Some findings using Islamic values can influence human behavior to change lifestyles to become more environmentally friendly (Siyavooshi et al., 2019).

Figure 5. STEM-*Engineering Design Process*

Figure 5 shows how STEM-EDP can be shown in Islamic STEM *Activity Storybook*. Storybooks filled with STEM learning must indicate how students can solve STEM problems with a student-centered approach. In Figure 5, no visual display of the finished product is shown so that students can imagine collaboratively designing the desired product according to learning objectives to practice critical and creative thinking skills.

CONCLUSION

The results of this study show how the relationship between the Strengthening Pancasila Student Profile project and STEM learning can be described through picture storybooks. In this STEM Activity Storybook, students can see examples of how project-based learning processes are initiated and completed by students. On the STEM-charged problem-solving journey, students can build positive relationships with their surroundings and trust regardless of religion, ethnicity, and gender. This storybook also contains HOTS questions about applying Pancasila in addressing diversity and STEM-EDP activities to be practiced at school with friends and teachers or at home with parents. In future research, a study on using books will be implemented *STEM Activity Storybook* in various learning environments at school and home.

ACKNOWLEDGMENT

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