



## RELIGIOUS VALUES-BASED LEARNING MATERIALS ON EARTH AND SPACE SCIENCE: ANALYSIS SPIRITUALITY AND CONCEPTUAL UNDERSTANDING LEVELS

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### ABSTRACT

This study aims to determine the effect of religious values-based earth and space science teaching materials on the level of mastery of concepts and spiritual attitudes. Using one group pretest-posttest design, 14 items of concept understanding essays test and 15 items of spiritual attitude questionnaire were given to 32 prospective elementary school science teachers who took earth and space science courses in the even semester of 2021/2022. The results of data analysis showed that 30.13% of prospective teacher an increase to the level of partial understanding and 34.60% of prospective teacher an increase to the level of sound understanding. In the aspect of spiritual attitudes, 91.25% of prospective teacher have the perception that their spiritual level has increased and 8.75% of prospective teacher have the perception that their spiritual level is fixed. These results indicate that the religious value-based science teaching materials used are good enough to increase the level of conceptual understanding and spiritual attitudes

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## BAHAN AJAR ILMU BUMI DAN ANTARIKSA BERBASIS NILAI RELIGIUS: ANALISIS SIKAP SPIRITUAL DAN PEMAHAMAN KONSEP

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### Kata Kunci:

Pemahaman konsep  
Ilmu bumi dan antariksa  
Bahan ajar  
Sikap spiritual

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### ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh bahan ajar ilmu bumi dan antariksa berbasis nilai religius terhadap peningkatan level penguasaan konsep dan sikap spiritual. Dengan menggunakan desain *one group pretes-postest*, 14 butir soal instrumen tes pemahaman konsep berbentuk essay dan 15 butir instrumen angket sikap spiritual diberikan terhadap 32 orang calon guru IPA sekolah dasar yang mengikuti mata kuliah ilmu bumi dan antariksa pada semester genap 2021/2022. Hasil analisis menunjukkan bahwa 30,13% mahasiswa calon guru mengalami peningkatan ke level pemahaman parsial dan 34,60% mahasiswa calon guru mengalami peningkatan ke level pemahaman utuh. Pada aspek sikap spiritual, 91,25% mahasiswa calon guru memiliki persepsi bahwa kadar sikap spiritualnya meningkat dan 8,75% mahasiswa calon guru memiliki persepsi bahwa kadar sikap spiritualnya tetap. Hasil ini menunjukan bahwa bahan ajar IPBA berbasis nilai religius yang digunakan sudah cukup baik dalam meningkatkan level pemahaman konsep dan sikap spiritual.

## 1. INTRODUCTION

Learning in the 21st century not only requires students to have knowledge but also demands that students become quality human resources by developing a number of thinking skills. To achieve this, every subject taught including science subjects, in addition to providing knowledge, must also be used as a means to develop higher thinking skills. Some of the higher order thinking skills that often appear with science include creative thinking skills, critical thinking, analytical thinking, problem solving and reflective thinking [1]. However, in addition to focusing on improving higher order thinking skills, one thing that should not be forgotten in education is character education. There are also considered important for successful teaching in the 21st century [2]. Character education will give birth to moral virtues (honesty, love, empathy, and trustworthiness) and performance virtues (effort, perseverance, and perseverance) in a person, so that in doing work someone will do the right thing and work as well as possible [3].

Several ways are done to insert character education in science learning, where one way that can be done is to connect it with religious teachings [4]. While some scientists view that science and religion are separate things, then morals are one of the important factors in the relationship between religion and science [5]. Religious teachings that lead to the formation of a person with noble character can be the basis for the implementation of character education that is integrated with science lessons. This is what then makes some countries continue to make moral education based on religious values continue to be carried out in accordance with science [6].

As a country that upholds religious and ethical values, character education is seen as very important in Indonesian education. This can be seen from how the formulation of educational goals in Indonesia puts forward the value of faith and devotion to God above other goals. The foundation that is the goal of education, has implications for the learning process carried out by teachers in any subject to be able to insert moral and ethical values based on religious values. However, based on the results of field studies, the fact that not all science teachers have the will and courage to integrate religious values in science learning. Because of the confusion about the scope of what religious values can be integrated in science learning, educators also have the truth of the integration carried out on the concept of science and religious values, because not every teacher is equipped with these abilities. Based on these problems, it is important for higher education providers of science teacher education candidates to be able to introduce religious value-based character education that is integrated in science learning. One way is to introduce the integration of religious values in science learning in the implementation of lecture programs conducted by lecturers.

In higher education, there are many science teacher candidates that have the potential to integrate religious values into them. The character of courses in science content whose objects of study are natural phenomena, provides many gaps for educators to be able to show the greatness and majesty of God in every phenomena shown by nature. One of these subjects is earth and space science. In this course, you will learn about the interconnections between the lithosphere, hydrosphere, atmosphere, and life on planet Earth, including the cycles of water, carbon, rock, and other materials that continuously shape, influence, and sustain the Earth and its inhabitants. systems of the Earth and the Sun and Moon interact with and influence life on Earth. With a broad scope related to natural phenomena, studying earth and space science will help someone to better understand the world as a place to live and provide awareness that the existing earth and space system is formed in such a way that it can facilitate the occurrence of life in it [7]. This awareness is expected to pave the way for educators to then insert a moral message to students that the existence of the

universe with all the facilities in it to support human life is an important proof of the existence of God as the creator and maintainer of the universe. When students feel amazed and amazed by the natural phenomena around them, it will become a bridge to achieve spiritual values [8]. Another advantage in earth and space science learning activities is that because the object of study is very close to everyday life, observations of earth and space phenomena will sharpen the ability of students to observe every aspect of life [9].

Several studies that lead to efforts to integrate religious characters in science learning have been carried out both through the application of learning strategies [10]–[13] and through integration in learning materials such as books [14], modules [8], [9], [15], [16], and multimedia [17]–[20]. The results of these studies provide an important recommendation that the integration of religious values in science learning can take place well and can be received with a positive response from students. This seems reasonable considering the character of the Indonesian people who uphold religious values in everyday life.

The strategies used in integrating religious values into science learning are mostly done by providing religious material outside the subject matter of science, such as the use of relevant Al-Quran verses [3], [6]–[9] and the delivery of religious material directly in the science learning process [12]. The integration of religious values in this way has one drawback that even though it is said that the science material is integrated with religious values, in fact the science material is still separated from the religious values that will be integrated.

In this study, researchers will examine the extent to which learning materials for Earth and Space Sciences integrated with religious values that have been previously developed for prospective science teachers in higher education can help students in addition to having good conceptual mastery, but can also help improve spiritual attitudes. The basic difference between the learning materials used in this research and previous studies and making it a novelty in this research is in the form of integrating religious values. In this learning material the insertion of religious values is directly integrated with the explanation of the concept. Every time a concept is explained, at that time religious values are raised and are closely linked with a logical thinking approach. In addition, another novelty in this research is in the analysis of increasing understanding of the concept which is not only based on mere statistical significance, but is also analyzed in depth by categorizing the understanding of the concept achieved according to the established criteria. The results of this study are expected to be an additional insight for educators in integrating religious values into natural science teaching materials, especially earth and space sciences.

## 2. METHOD

This study uses experimental quantitative research with the One-Group Pretest-Posttest Design [21], where students are given a test before being given treatment (pretest), given treatment in the form of Earth and Space Science lectures which are carried out independently using learning materials based on religious values. After learning is done then given a final test (posttest). The samples of this research were students of the Elementary School Teacher program, Faculty of Teacher Training and Education, University of Muhammadiyah Prof. Dr. Hamka who is taking earth and space science courses in the even semester of 2021/2022. The sample consisted of 32 people consisting of 8 male and 24 female.

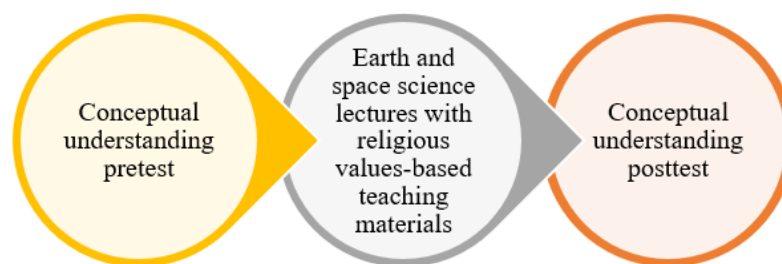


Figure 1. One Group Pretest Posttest Research Design

The integration of religious values into earth and space science teaching materials used in the lecture program is by expanding the explanation of the material directed at mastering concepts by building logical thinking reasoning to arrive at the conclusion that all phenomena in the earth and space science material are things that are impossible can happen by chance and stand alone but through a thorough grand design process so as to form orderly systems in which students' logic can finally reach an awareness that God Almighty is the creator of the universe, regulator, guardian and is the owner of all knowledge bestowed for the benefit of man himself. As for the use of the verses of the Qur'an, they are presented in appropriate portions to further foster confidence that all phenomena that occur are contained in the Qur'an which is the word of God Almighty.

In this study, tests and questionnaires were used as data collection instruments. The test instrument consists of 14 essay questions to measure students' mastery of concepts in the Hydrological Cycle material. The indicators of the concept mastery instrument and the assessment rubric to categorize the weight of the assessment are shown in table 1 and table 2. The test instrument used has been through expert assessment and validity and reliability tests.

Table 1. Indicators and Sub-Indicators of Concept Understanding Instruments

Indicators of Understanding the Hydrological Cycle Concept	Sub-Indicators of Understanding the Concept of the Hydrological Cycle
Explain the characteristics of the molecular structure of Water	<ul style="list-style-type: none"> <li>Explain why the bonding of water molecules causes water to be liquid</li> <li>Explain why the structure of water in its liquid and solid form (ice) can be seen while in gaseous form (water vapor) it is invisible</li> </ul>
Explain the processes in the hydrologic cycle	<ul style="list-style-type: none"> <li>Explain why the freezing process requires cooling in the freezer</li> <li>Explain the mechanism of the formation of rain drops from clouds</li> <li>Explain why raindrops are round</li> <li>Explain the different mechanisms of hail and snowfall</li> <li>Explain why the hydrological cycle can produce clean water</li> <li>Explain why seawater tastes salty</li> <li>Explain the function of tropical forests in the context of the hydrological cycle</li> </ul>
Explain various problems in the hydrological cycle	<ul style="list-style-type: none"> <li>Explain how shady trees can prevent flash floods during heavy rains</li> <li>Explain why cumulonimbus clouds are called the death lane for aviation</li> <li>Explain how the trend of changes in the amount of liquid water on earth from year to year</li> <li>Explain the various factors that can cause a spring to be lost in the context of the hydrological cycle</li> <li>Explain the factors that cause flooding in the rainy season and drought during the dry season in the context of the hydrological cycle.</li> </ul>

To check the answers to the essay tests given by students, an essay scoring rubric is used using the rubric for the category of student understanding level which consists of 3 categories, namely not understanding the concept (NU), partial concept understanding (PU) and Sound Understanding (SU), which were adopted from the first level. understanding the concept of Abraham et al. [22] dan Çalik & Ayas [23] by setting aside the misconception aspect first. The criteria for the three levels of concept understanding are shown in Table 2.

**Table 2.** Category Level of Concept Understanding

No	Understanding Level	Answer Assessment Criteria	Score
1	Not Understanding (NU)	Blank Answers, Giving answers “I don't know”/“I don't understand”, rewriting the question, writing down answers that are irrelevant, unclear, illogical and wrong.	0
2	Parsial Understanding (PU)	The answers show understanding of the concept but also contain irrelevant statements. The answer includes at least one component of the correct response, but does not include all components of the complete answer	1
3	Sound Understanding (SU)	The answer includes all components of the correct answer, none of the elements of the answer are irrelevant	2

In addition to using a test instrument, this study also used a questionnaire instrument containing 15 statements to measure the spiritual attitudes of prospective teacher students while the indicators of the spiritual attitude questionnaire instrument were shown in table 3.

**Table 3.** Indicators and Sub-Indicators of Spiritual Attitude Instruments

Spiritual Attitude Indicators	Spiritual Attitude Sub Indicators
Belief in the Attributes and Greatness of Allah SWT	<ul style="list-style-type: none"> <li>• The belief that the existence of heaven and earth and all the phenomena in it is proof that Allah SWT exists</li> <li>• belief that everything on Earth has been designed by Allah SWT.</li> <li>• The belief that everything created by Allah SWT is not in vain for living beings</li> <li>• Belief that Allah SWT is the Most Preservative and Most Protective of the creatures He has created</li> </ul>
Belief that Allah SWT Creates and Masters all knowledge	<ul style="list-style-type: none"> <li>• The belief that all natural phenomena are the knowledge of Allah SWT which is spread on Earth to be used by humans.</li> <li>• My belief that the natural sciences (physical sciences) discovered by scientists are actually the knowledge of Allah SWT</li> <li>• The belief that the knowledge of nature is in harmony with the truth of God's word written in the holy book Al-Quran.</li> <li>• The belief that the knowledge and knowledge possessed by humans are only a small part of Allah's knowledge</li> <li>• The belief that no matter how high science and technology are controlled by humans, it will never match the creation of Allah SWT</li> </ul>
The belief that the phenomenon of the hydrological cycle is a provision of Allah SWT which has been designed for the benefit of humans	<ul style="list-style-type: none"> <li>• The belief that the water molecule is a polar molecule was designed and determined with great care by Allah SWT and not by chance</li> <li>• The belief that the melting point of water is 0°C and the boiling point of water is 100°C at a pressure of 1 atm is not a coincidence but a provision designed by Allah SWT.</li> <li>• The belief that the phenomenon of the hydrological cycle witnessed by humans on earth is a sign of the greatness of Allah SWT</li> <li>• The belief that the process of the hydrological cycle that occurs on earth is in perfect harmony with the information stated by Allah SWT in the holy book Al-Quran</li> </ul>

- The belief that the wind is not a mere natural phenomenon that can arise due to pressure differences, but is a medium created by Allah SWT to move the clouds to send rain in the direction He wants.
- Belief that all disasters that occur on earth are sent by Allah SWT as a result of human activity

For concept understanding test data, data analysis was carried out in three stages. First, categorize the level of concept understanding that has been achieved by each research subject in each item. Second, calculate the average percentage of students at each level of concept understanding for each item of the instrument. Third, mapping the average pattern of increasing level of concept understanding based on the results of the pretest and posttest. As for the spiritual attitude questionnaire data, the data analysis carried out only calculated the percentage in each questionnaire scale category so that it could be seen how many percent of students experienced an increase in spiritual attitudes after using religious value-based earth and space science teaching materials.

### 3. RESULTS AND DISCUSSION

The research was conducted by giving treatment to the sample in the form of applying independent teaching materials for Earth and Space Sciences based on religious values. In this study, the treatment given was to provide learning about Earth and space sciences on hydrosphere material (water characteristics, water molecular structure, changes in water form and the hydrological cycle) using teaching materials that were integrated with religious values. The integration of religious values into teaching materials is technically done by providing two unified features in the explanation of a concept. (See Figure 2). When a concept is explained (eg the concept of changing the shape of water) in the main menu of teaching materials, on the right side two features will appear, namely scientific explanation (expansion of concept explanation) and spiritual reflection (instilling religious values).

When the scientific explanation menu is opened, a number of more detailed explanations regarding the sub-concepts related to the main concept will appear. It provides a detailed explanation of how a phenomenon that we see in everyday life is explained scientifically. For example, when the main menu displays an explanation of changes in the state of water, then the scientific explanation menu will display a detailed explanation of how changes in form occur in terms of changes in molecular structure.



Figure 2. Main Features of Teaching Materials (Left) and Additional features (Right) Consisting of Scientific Explanation and Spiritual Reflection



As for when the spiritual reflection menu is opened (see Figure 3), an expansion of the explanation of the concept in the form of wisdom contained in the scientific phenomena presented will appear which displays a "miracle" outside of scientific explanation and relates it to the attributes of divinity, so that it will help lead to 'miracle'. the growth of religious attitudes. For example, when the main menu and scientific explanation explain the process of changing the structure of water molecules in the process of changing form, then spiritual reflection explains how a water anomaly event will make a lake that is at a low temperature only freeze its top layer so that underwater creatures will stay alive. This is a form of God's love in taking care of every creature through a system that has been designed perfectly.

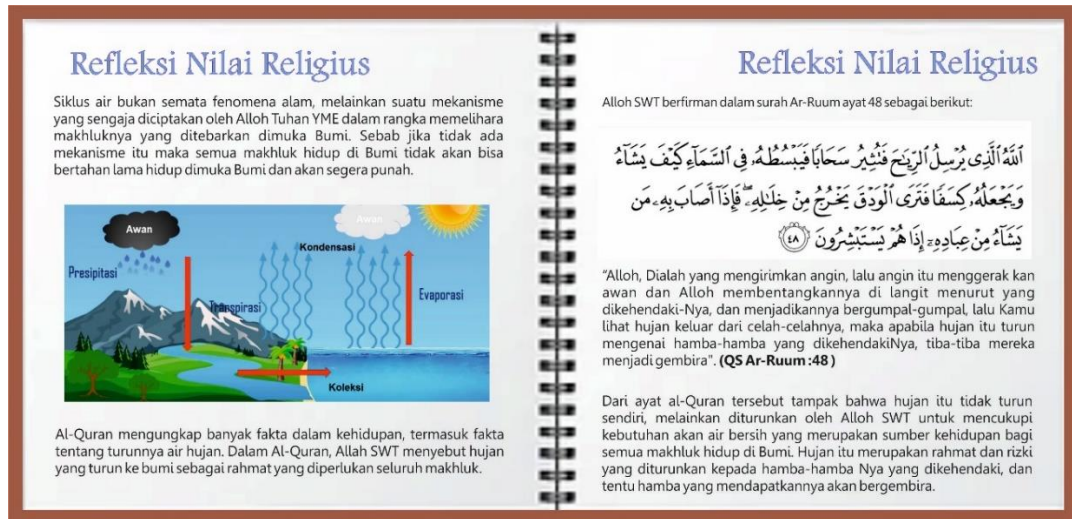


Figure 3. The Feature of Spiritual Reflection Presents an Expansion of the Explanation of the Concept towards the Application of Religious Values

The research was conducted by giving treatment to the sample in the form of applying independent learning materials for Earth and Space Sciences based on religious values. Before the treatment was carried out, a pretest was first conducted to determine the level of understanding of the students' initial concepts. After the treatment activities were completed, a posttest was conducted to determine changes in the level of understanding of students' concepts after the treatment was carried out. Table 4. shows the percentage of achievement of the level of understanding of the concept based on the results of the pretest and posttest on each item.

Table 4. Percentage of Concept Mastery Level for Each Indicator Item

Item	Not Understanding		Parsial Understanding		Sound Understanding	
	Pre %	Post %	Pre %	Post %	Pre %	Post %
1	96.88	62.50	3.13	9.38	0.00	28.13
2	84.38	34.38	15.63	43.75	0.00	21.88
3	100.00	15.63	0.00	56.25	0.00	28.13
4	50.00	3.13	50.00	21.88	0.00	75.00
5	68.75	6.25	31.25	53.13	0.00	40.63
6	90.63	18.75	9.38	68.75	0.00	12.50
7	78.13	59.38	21.88	34.38	0.00	6.25
8	75.00	37.50	25.00	50.00	0.00	12.50
9	31.25	6.25	68.75	37.50	0.00	56.25
10	21.88	0.00	78.13	21.88	0.00	78.13
11	15.63	0.00	84.38	56.25	0.00	43.75
12	81.25	25.00	18.75	65.63	0.00	9.38
13	56.25	18.75	43.75	65.63	0.00	15.63

14	87.50	6.25	12.50	37.50	0.00	56.25
Average	66.96	20.98	33.04	44.42	0.00	34.60

Based on Table 4, it is known that before being given treatment almost all indicators of concept understanding, most of the students were at the level of not understanding (NU) and partial understanding (PU). Before being given treatment, it appears that none of the students are at the Sound Understanding (SU) level. This shows that students' initial understanding of the hydrological cycle material is still very lacking. Clearly the comparison of the average number of students at each level of concept understanding based on the results of the pretest and posttest is shown in Figure 4.

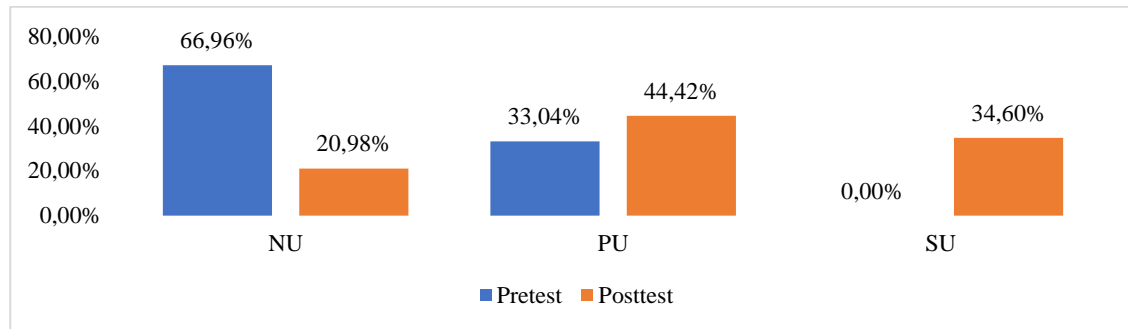


Figure 4. Comparison of the Level of Conceptual Understanding Between Pretest and Posttest

After being treated, it appears that the percentage of students at the NU level has decreased, while the percentage of students at the PU and SU levels has increased. To further clarify how the pattern of movement changes in the level of understanding of the concept at each level can be seen in Figure 5.

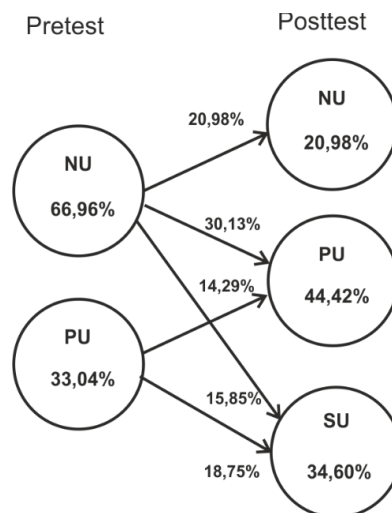


Figure 5. The pattern of Changes in the Level of Understanding of the Concept from Pretest to Posttest

Based on Figure 5, it can be seen that after receiving treatment in the form of independent learning using learning materials for earth and space sciences based on religious values, as many as 66.96% of students who were previously at the NU level increased to the PU level by 30.13%, increased to the SU level by 15, 85% and the remaining 20.98% remained at the NU level (no increase). As many as 33.04% of students who were previously at the PU level experienced an increase to the SU level of 18.75% and the remaining 14.29% remained at the PU level (no increase). The pattern of improvement that occurs in each item is shown in detail in the Table 5.



**Table 5.** Percentage of Increase in Concept Mastery Level for Each Indicator Item

Item	NU→NU (%)	PU→PU (%)	NU→PU (%)	NU→SU (%)	PU→SU (%)
1	62.50	0.00	9.38	25.00	3.13
2	34.38	9.38	34.38	15.63	6.25
3	15.63	0.00	56.25	28.13	0.00
4	12.50	6.25	6.25	31.25	43.75
5	6.25	12.50	40.63	21.88	18.75
6	18.75	3.13	65.63	6.25	6.25
7	53.13	21.88	18.75	6.25	0.00
8	37.50	15.63	34.38	3.13	9.38
9	6.25	28.13	9.38	15.63	40.63
10	0.00	9.38	12.50	9.38	68.75
11	0.00	43.75	12.50	3.13	40.63
12	25.00	9.38	56.25	0.00	9.38
13	15.63	40.63	28.13	12.50	3.13
14	6.25	0.00	37.50	43.75	12.50
Average	20.98	14.29	30.13	15.85	18.75

Based on Table 5, it can be seen that a total of 35.27% students did not experience an increase in the level of mastery of concepts (still at the NU or PU level), 30.13% increased to the PU level and 34.60% increased to the SU level. These results indicate that the application of independent learning materials in Earth and space science lectures results in an increase in the level of understanding of concepts that is not very good considering the percentage of students who can achieve a complete level of understanding of concepts in hydrological cycle material is still low.

As an example of how the process of changing the level of concept understanding that occurs in students after receiving treatment in the form of applying teaching materials that are integrated with religious values, in Figure 6, an example of one of the students' answers that increases from the NU level to the PU level, from the NU level to the SU level and from PU level to SU level is shown.

<p><b>Pertanyaan :</b> Jelaskan mengapa kita dapat melihat air, dapat melihat es, tetapi tidak dapat melihat uap air disebuah ruangan?</p> <p><b>Question :</b> Explain why we can see water, can see ice, but can't see water vapor in a room?</p>		
<b>NU→PU</b>	<p><b>Jawaban Pretest R3:</b> Karena uap air merupakan molekul berbentuk gas sehingga tidak terlihat oleh kasat mata (NU)</p> <p><b>Pretest R3 Answers:</b> Because water vapor is a gaseous molecule so it is not visible to the eye directly (NU)</p>	<p><b>Jawaban Posttest R3:</b> Karena struktur molekul uap air saling terpisah satu sama lain, jadi uap air tidak bisa terlihat disebuah ruangan (PU)</p> <p><b>Posttest R3 Answer:</b> Because the molecular structure of water vapor is separated from each other, so water vapor cannot be seen in a room (PU)</p>
<b>NU→SU</b>	<p><b>Jawaban Pretest R4:</b> Karena partikel uap air yang bertemu cahaya akan menjadi transparan sehingga tidak dapat dilihat mata (NU)</p> <p><b>Pretest R4 Answers:</b> Because the water vapor particles that meet the light will become transparent so they cannot be seen by the eye (NU)</p>	<p><b>Jawaban Posttest R3:</b> Karena uap air memiliki susunan partikel yang sangat renggang akibat gaya tarik antar partikel sangat lemah. Ketika partikel cahaya mengarah ke partikel uap air, hanya sedikit saja yang dipantulkan, sehingga tidak dapat terlihat oleh mata (SU)</p> <p><b>Posttest R3 Answer:</b> Because water vapor has a very tenuous molecular arrangement due to the very weak attraction between the particles. When light particles are directed at water vapor particles, only a small amount is reflected, so they cannot be seen by the eye (SU)</p>
<b>PU→SU</b>	<p><b>Jawaban Pretest R12:</b> Karena molekul uap air sangat renggang sehingga terlihat transparan</p> <p><b>Pretest R12 Answers:</b> Because the water vapor molecules are so tenuous they appear transparent (PU)</p>	<p><b>Jawaban Posttest R12:</b> Molekul uap air memiliki gaya tarik sangat lemah sehingga jarak antar molekul berjauhan. Akibatnya, hanya sedikit saja cahaya yang dipantulkan, sehingga tuap air tidak dapat terlihat oleh mata (SU)</p> <p><b>Posttest R3 Answer:</b> Water vapor molecules have a very weak attraction so that the distance between the molecules is far apart. As a result, only a small amount of light is reflected, so the water vapor cannot be seen by the eye (SU)</p>

**Figure 6.** Examples of Student Answers that show an Increase in the Level of Understanding of the Concept

The results of this study strengthen several previous studies which reported that there are still many difficulties for students and teachers in explaining earth and space phenomena because they are related to concepts that are quite complex and difficult to understand [24]–[27]. This shows that efforts to improve understanding of earth and space phenomena must be carried out by continuously developing various learning strategies and approaches, one of which is by focusing on phenomenon-based learning through multi-representation construction [28]. Considering that the independent learning materials applied in this research are only static e-books that are not enriched with dynamic features, it is natural then to give the results of increasing the level of understanding of the concept which is still low considering that in the hydrological cycle material there are many detailed aspects of the material that require more modeling. dynamically to produce a more complete understanding. Several other studies have also suggested the importance of developing teaching materials in an interactive form to better support conceptual understanding and some higher order thinking skills [29]–[31], especially if to learn microscopic concepts, the use of visual multimedia is highly recommended to be able to increase the level of understanding of concepts towards scientific concepts [32]–[34].

In addition to increasing the level of concept understanding, another aspect that is the focus of attention in this study is the increase in the level of spiritual attitudes. In this study, Earth and space science learning materials applied in independent lectures have been equipped with the integration of Islamic religious values, where each concept explanation is always accompanied by a narration that tries to raise students' awareness of the values of God. Based on the spiritual disclosure questionnaire given at the end of the lecture, the results are shown in Table 6.

**Table 6.** The Percentage Increase in the Level of Spiritual Attitude in Each Indicator Item

Item	Increases %	Still%	Decreases%
1	90.63	9.37	0.00
2	93.75	6.25	0.00
3	93.75	6.25	0.00
4	100.00	0.00	0.00
5	90.63	9.37	0.00
6	90.63	9.37	0.00
7	96.88	3.12	0.00
8	93.75	6.25	0.00
9	93.75	6.25	0.00
10	87.50	12.50	0.00
11	84.38	15.62	0.00
12	84.38	15.62	0.00
13	90.63	9.37	0.00
14	90.63	9.37	0.00
15	87.50	12.50	0.00
Average	91.25%	8.75%	0.00%

Based on Table 6, it can be seen that in all the indicators of the spiritual attitude statement, most of the students who have the perception that the level of their spiritual attitude is increasing and only a small part have the perception that the level of their spiritual attitude is fixed, and none of the students have the perception that the level of their spiritual attitude decreased after attending Earth and space science lectures using earth and space science learning materials based on spiritual values. These results are in line with previous studies which state that the integration of religious values in the learning of Earth and Space Sciences is similar to the material for the theory of the creation of the universe which is explained by the Qur'an Surah *An-Naziat* verses 27-33 [4], the material for the

coastal environment which associated with divine attributes such as God is the creator and God almighty [10], the material of the hydrological cycle cycle which is associated with divinity such as the merciful God, great creator and the great design of the universe cycle [13] can take place well and can be accepted by students and results in a significant increase in students' spiritual attitudes. Materials related to science have considerable potential to be able to integrate spiritual values into them because the phenomena and regularity of the system displayed by nature are beyond human power so that in the end it will grow religious awareness.

The results of this study in addition to strengthening the results of previous research that science subjects, especially Earth and Space Sciences have great potential to integrate religious values, also provide a new recommendation that the process of increasing mastery of concepts (cognitive) can be carried out in line with the growth of spiritual attitudes (affective). While other studies with similar themes show more religious aspects that are separate from knowledge aspects, in this study the integration of religious values is carried out in line with the formation of knowledge aspects, so as to form a comprehensive material structure that is mutually reinforcing in increasing aspects of mastery of concepts and spiritual attitudes. These results provide important recommendations for science educators so that they do not hesitate to integrate spiritual values in science learning with levels and scopes that are in line with the characteristics of the science subjects themselves so that they contribute to the achievement of educational goals in the aspect of religious character while still having clear boundaries. with religious education subjects.

#### 4. CONCLUSION

Based on the results of research on the influence of religious values-based Earth and Space Science learning materials on the level of mastery of concepts and spiritual attitudes, it can be concluded that as many as 30.13% of prospective teacher students experienced an increase in the level of understanding of concepts to the level of PU, 34.60% of prospective teacher students experienced an increase in the level of understanding concepts to the SU level and as many as 35.27% of prospective teacher students did not experience an increase in the level of mastery of concepts (still at the NU or PU level). As for the aspect of spiritual attitude, as many as 91.25% of prospective teacher students have the perception that the level of spiritual attitude has increased and as many as 8.54% of prospective teacher students have the perception that the level of spiritual attitude is constant, and none of the students have the perception that the level of spiritual attitude decreased after attending Earth and space science lectures using spiritual value-based earth and space science learning materials

These results indicate that the application of teaching materials in Earth and space science lectures has been quite good in increasing the level of spiritual attitudes and increasing the level of concept understanding even though the percentage of students who can reach the level of complete concept understanding on the hydrological cycle material has not reached 100%. In the future, this teaching material needs to be further developed so that it is enriched with various dynamic multi-representations supported by technological features to produce phenomenon-based learning that can help construct student understanding even better. In addition, this teaching material also needs to be expanded its focus not only on affective aspects (spiritual attitudes) but also focuses on aspects of higher-order thinking skills so that it can then be seen whether improvements in the three learning aspects can be carried out simultaneously.

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