Embedding spiritual value through science learning

To cite this article: H Johan et al 2018 J. Phys.: Conf. Ser. 1013 012083

View the article online for updates and enhancements.
Embedding spiritual value through science learning

H Johan*, A Suhandi, A R Wulan, Widiasih, A Ruyani, B Karyadi and Sipriyadi

1Sekolah Pascasarjana, Universitas Pendidikan Indonesia, Bandung, Indonesia
2Program Studi Pendidikan Fisika, Jurusan Pendidikan MIPA, FKIP, Universitas Bengkulu, Bengkulu, Indonesia
3Departemen Pendidikan Fisika, Fakultas Pendidikan MIPA, Universitas Pendidikan Indonesia, Bandung, Indonesia
4Departemen Pendidikan Biologi, Fakultas Pendidikan MIPA, Universitas Pendidikan Indonesia, Bandung, Indonesia
5Fakultas Keguruan dan Ilmu Pendidikan, Universitas Terbuka, Tangerang Selatan, Indonesia
6Magister Program in Science Education, Bengkulu University, Bengkulu, Indonesia
7Jurusan Biologi, Fakultas MIPA, Universitas Bengkulu, Bengkulu, Indonesia

*Corresponding author’s e-mail: hennyjohan88@gmail.com

Abstract. The purpose of this study was to embed spiritual value through science learning program especially earth planet. Various phenomena in earth planet describe a divinity of super power. This study used quasi experimental method with one group pre-test-post-test design. Convenience sampling was conducted in this study. 23 pre-service physics teacher was involved. Pre-test and post-test used a questionnaire had been conducted to collected data of spiritual attitude. Open ended question had been utilized at post-test to collected data. A fourth indicators of spiritual value related to divinity of God was used to embed spiritual value. The results show a shifted of students’ awareness to divinity of God. Before implementing the earth planet learning, 85.8% of total students strongly agree that learning activity embed spiritual value while after learning process, it increased be 93.4%. After learning earth planet, it known that students’ spiritual value was influenced by character of earth planet concept which unobservable and media visual which display each incredible phenomena process in our earth planet. It can be concluded that spiritual value can be embedded through unobservable phenomena of during learning earth planet process.

1. Introduction
The youth are important element for development in a country. Now days more youth are intricate in wrongdoing and abuse of narcotics [1]. The youth is getting far away from the moral and spiritual values. Religious and spirituality are an important role and give contribute for developing our life [2]. Spirituality plays significant role to reduce various problems in life [3]. Education must be a manner to enhance moral and spirituality of youth. Earth and space science include concept of earth planet is very potential to embed spirituality values. Natural phenomena in earth planet reflect God gracious.
Various concept of earth planet related to an imaginary of natural phenomena [4]. Natural phenomena such as incoming solar radiation at equator, northern earth, and southern earth can’t be observed directly. Concept incoming solar can be seen in Figure 1.

![Figure 1. Concept incoming solar radiation on earth surface](image)

Earth’s indirect and direct sunlight: there are angles of sunlight. The earth spins around the sun. There are rays of sunlight facing the earth. Unobservable phenomena remain us to limitations of science. Therefore, spirituality value is potential to be embedded through learning earth planet. is potential to insert. Axiology and ontology sides are relevant to implemented in learning for embedding spiritual aspect [5].

Some scientists have a tendency to separate science concept include earth science from spiritual or religious aspect [6]. The axiology side from learning earth and space science is to increase the awareness of the existence and greatness of God Almighty. In National Standards of Higher Education Every, it is stated that graduate must have a religious and spiritual competence [7]. This is related to Common description of the Indonesian National Qualification Framework (KKNI) that state every level qualification must include religious competence [7]. Embedding spirituality through science learning especially earth and space science had not been extensively reported. Novelty in this study is to provide earth science learning process that embedded spiritual aspect. Embedding spirituality was done by inserting spiritual value in natural phenomena connected to earth’s planet. Novelty in this study is also to harness media visual to insert spiritual value in unobservable concept and using instructional question to lead student totally realize to the nature of divinity. Long-term goal of this study is to be solution for common description of Indonesian National Qualification Framework (KKNI) related to religious competence.

2. Methods

2.1. Research Design

This study used quasi experimental with one group pre-test post-test design. Design in this study can be seen in Figure 2.
2.2. Research Subject

23 physics teacher students were involved in this study. Subject in this study never got earth and space science course before. Convenience sampling was used in this study.

2.3. Instrument Collecting Data

Data were collected by two types of instrument. Questionnaire and open ended questions were aided to collect data. Questionnaire was given at pretest and posttest. Questionnaire implemented to this study can be seen in Table 1.

Another instrument was open ended questions. Open ended question was given at post-test only. Open ended questions included four questions. A sample of question in open ended instrument can be seen below:

“After learning earth planet, please explain how the earth planet phenomena in learning activities make you more realize that God is the infinite balancing?”

Before implemented these instruments were validated by 4 experts. The result of validating process showed that the instruments were valid to use in this study and the instruments have a good legibility. Developing instrument process doesn’t be a focus discussion in this article.
2.4. **Learning Process**
During learning activities, media visuals were castoff to show each steps of unobservable phenomena process. Media visual was able to show incredible phenomena in earth planet. Incredible natural phenomena reflect the super power. Media visual influenced embedding spiritual value during learning process.

2.5. **Analysis Data**
Students’ responses from open ended were coded to find the pattern of the responses related to embedding spiritual value. Questionnaire and open ended questions were analyzed qualitatively to get description of the shifted of students’ awareness related to God divinity.

3. **Results and Discussion**

3.1. **Result**
The shifted of students’ spirituality was obtained from scores pre-test and post-test using questionnaire. Pre-test was conducted to get the description of student spirituality before learning process. Most of students’ responses before learning process show that their spirituality are in agree and strongly agree level. Data of students’ spirituality before and learning earth planet can be seen in Table 2.

| No | Question                                      | Responses (%) | strongly agree | agree | disagree | strongly disagree |
|----|-----------------------------------------------|---------------|----------------|-------|----------|------------------|
| 1  | I realize that God is the infinite balancing  | 82.6          | 17.4           | 0     | 0        |
| 2  | I realize that God is the infinite merciful   | 86.96         | 13.04          | 0     | 0        |
| 3  | I realize why need to be wise to nature       | 91.3          | 8.7            | 0     | 0        |
| 4  | I realize why need to be grateful to God      | 82.6          | 17.4           | 0     | 0        |
|    | **Average of responses (%)**                 | **85.865**    |                | **14.135** | 0   | 0        |

Post test was conducted to collect the data of student spirituality as impact of embedding spiritual value through learning earth planet. After learning process, there is a shifted of students’ spirituality to strongly agree level. Students’ spirituality after learning earth planet can be seen in Table 3.

| No | Question                                      | Responses (%) | strongly agree | agree | disagree | strongly disagree |
|----|-----------------------------------------------|---------------|----------------|-------|----------|------------------|
| 1  | I realize that God is the infinite balancing  | 91.3          | 8.7            | 0     | 0        |
| 2  | I realize that God is the infinite merciful   | 95.65         | 4.35           | 0     | 0        |
| 3  | I realize why need to be wise to nature       | 95.65         | 4.35           | 0     | 0        |
| 4  | I realize why need to be grateful to God      | 91.3          | 8.7            | 0     | 0        |
|    | **Average of responses (%)**                 | **93.475**    |                | **6.525** | 0   | 0        |
Students’ responses from open ended question show that their spirituality was influent by content of earth planet concept related to various incredible phenomena and media visual to display various incredible phenomena.

Table 4. Sample of students’ responses through open ended questions

| No | Question                                                                 | Sample of earth planet concept that influence students’ spirituality                                      |
|----|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1  | After learning earth planet, please explain how the earth planet phenomena make you more realize that God is the infinite balancing | Student explained that the concept of replacement of day and night, reciprocation of seasons reflect that God is the infinity balancing |
|    | After learning earth planet, please explain how the earth planet phenomena make you more realize that God is the infinite merciful   | Student explained that concept of rain which fall anywhere not only at beach or ocean as the source of evaporation but also rain fall at mountain area, it reflects that God is the infinity merciful |
| 2  | After learning earth planet, please explain why need to be wise to nature  | Student explained that concept of natural resources and its utilization make them apprehend that is a need to be wise to nature |
| 3  | After learning earth planet, please explain why need to be grateful to God | Student explained that abundant oxygen and water are samples of reason to be more grateful to God |

3.2. Discussion

Based on data in Table 2 and Table 3, it’s seen that students’ spirituality has shifted after the learning process. Before learning process, average of student response related to their belief to infinity of God was in “agree” level is 14.135% and 85.865% in “strongly agree” level. After learning process, students’ responses was in “strongly agree” level increase to be 93.475 % and students’ responses in “agree” level decrease to be 6.525% from 14.135%. The shifted of students responses indicated that spiritual value was embedded during learning earth planet. According to data in Table 4, the shifted of student’s spirituality is affected by the character concept that unobservable directly. Allegedly, media visual used during learning earth planet also give contribution in embedded spiritual value. Chain till unanswered question can be another way to embedding spiritual aspect [8]. Sample of media visual using during learning program to support embedding spiritual value can be seen in Figure 3.

Figure 3. Sample of media visual that display exchange season process used in learning earth planet
Figure 3 is a sample of media visual used to display season exchange. Media visual used during learning earth planet are figure and animation. Media visual helped student to understand concept and embedding spiritual value at once. By helping media visual student can see the exchange season at northern earth and southern earth. Student also can see how it balances each other. Figure 4 show sample of student’ responses that explained the concept of replacement of day and night, reciprocation of seasons reflect that God is the infinity balancing and concept of natural resources and its utilization make them apprehend that is a need to be wise to nature.

![Figure 3](image)

**Figure 3.** Media visual used to display season exchange.

![Figure 4](image)

**Figure 4.** (a) and (b) Sample of students’ evidences related spiritual value in earth planet concept that impact their spirituality.

Student’s responses in Figure 4 (a) give evidence that “content of earth planet concepts show that God is the infinite balancing. For example: God create some season and there is a reciprocation of seasons, if seasons don’t exchange each other it makes existence on earth will not balance and not stay longer”. Student’s responses in Figure 4 (b) give evidence that “concept of natural resources and its utilization make them apprehend that is a need to be wise to nature. For example: mountain, ocean, lake and everything in it must be utilized wisely so natural resources will be sustainable”.

Spiritual or religious aspect should be implemented in curriculum including science [9]. Experience in using thinking skill such logic thinking or reasoning skill can be harnessed to lead student realize the limitation of knowledge [10]. Science and spiritual aspect was integrated in learning science activity allowing the occurrence of complementation, comparison, inductive, and verification. Integrated science and spiritual aspect also used chain till unanswered question in learning earth science [11, 8]. The concerned of belief in a science occupied worldview involved the root of religion [12]. [8] Hayward stated that science learning especially astrology can be attached as beneficial media to understand the enormous scenery of religion, divulges that religion and spirituality are spreading [13]. ”I see religion as an attempt to understand the purpose of our universe and science as an attempt to understand its nature and characteristics” [14].

Indicators of spiritual value in this study were based on religious attitude competency in general description of Indonesian National Qualification Framework (KKNI). This competency was divided to be spiritual values linked to earth phenomena. Religious learning program is not the only one way to embed and enhance students’ spirituality. Inserting spiritual value can conduct in learning science especially earth and space science learning. God spirituality in side human is very potential to block outside negative influences in global world [15]. Spirituality is important to avoid moral’s degradation. Spirituality can give impact to our religious and awareness of God Almighty [16]. This study expected can be base line to develop science learning program that also focus to embedding spirituality.

4. **Conclusion**

Based on the findings in this study, it can be concluded that earth planet learning supported by media visual can embed spiritual value. Embedding spiritual value during learning earth planet was
successfully enhanced students’ spirituality. Before implementing the earth planet learning, 85.8% of total students strongly agree that learning activity embed spiritual value while after learning process, it increased be 93.4% of total students. Content of earth planet concept and media visual related to various unobservable earth phenomena were successfully impact students’ spirituality. Various unobservable earth phenomena prime student to aware that there is something super power who design planet earth perfect precisely. Learning activity leads student to aware the limitedness of science and totally realized to divinity of God. This learning design expected to be a solution of Indonesian National Qualification Framework approximately religious value in science education.

5. References

[1] N. Unayah and M. Sabarisman 2015 Sosio and Informa 1 2 121-140
[2] G. Kame and R. S. Tshaka 2015 Teologiese Studies/Theological Studies 71 3 1-6
[3] Anita 2015 Asian Journal of Educational Research & Technology 5 1 80-83
[4] D. Sunderlin 2009 Journal of Geoscience Education 57 1 73-81
[5] D. Rousseau 2014 Journal of Religion & Science 49 2 476-508
[6] Stuart Hall, Stephen McKinney, Kevin Lowden, Marjorie Smith, and Paul Beaumont 2014 Journal of Beliefs & Values: Studies in Religion & Education 35 1 90-107
[7] Ministerial regulation 2014 Appendix No. 49 of 2014 on National Standards of Higher Education
[8] Henny Johan, Andi Suhandi, Ahmad Samsudin, and Ana Ratna Wulan 2017 AIP Conference Proceedings 1868, 080004
[9] P. Mudge, Daniel Fleminga and Terence Lovat 2014 Journal of Beliefs & Values 35 2 144–154
[10] D. Jackson, C. Doyle, H. Capon, and E. Pringle 2016 Journal of Religion, Spirituality & Aging 28 4 281-295
[11] Karwadi 2008 Journal of Religious Study 7 3 516-536
[12] A. O. Benz 2017 Journal of Religion & Science 52 1 186-195
[13] M. Hayward 2013 Journal of Beliefs & Values: Studies in Religion & Education 34 2 269-271
[14] C. Townes 2013 An edited transcription of the presentation at the ASA Annual Meeting at Pepperdine University, Malibu, California 5 3
[15] Brandon K. Burr, J. Brooke Kuns, La Donna Atkins, Anita Glee Bertram, and Kaye Sears 2015 Journal of Religion, Spirituality & Aging 27 2-3 183–200
[16] S. Muthohar 2013 Nadwa Journal of Islamic Education 7 2 321-334

Acknowledgments

The authors thank to the Ministry of Research and Technology and Higher Education (Research-Higher Education) for the Doctoral Dissertation Grant Funds.