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The Integration of Science-Technology and Living Environment through Islam Religion Education Learning at Adiwiyata-Based Junior High School in Banyumas Regency

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Abstract

Sciences play an important role for human in living their life and technology constitutes the embodiment of human's systemic effort in applying the sciences so that it can make things easier and provide wealth for human when it is followed by religion. However, it will bring disaster instead when it is not inspired by religion. One of the destructive impacts of science advancement is environmental crisis. This environmental crisis occurs because of spiritual emptiness, human are far from God. They succumb to greed and keep themselves away from God's moral guideline and lack ethics in interacting with God's other creatures. In the academic world, Islam Religion learning constitutes a medium to filter or minimize some human destructive measures to the nature, making the integration of sciences, technology and environment in learning a key to the creation of sciences, technology and environment harmonization. Using qualitative research with a case study approach, it is expected that the ideal picture of science-technology and living environment sinergy can be obtained. The data are collected using observation, interview and documentation and analyzed using reduction, display and conclusion techniques as well as data verification. The research results indicate that the integration of science-technology and living environment constitutes the highest truth, i.e. the empirical truth which symbolizes the might of Allah, the Almighty Creator, and an effort of synergizing the *qauliyah* (textual) and *kauniyah* (universal) verses and of indirectly eliminating the scientific dichotomy. This synergy pattern will never be manifested without Islam Religion Education learning in academic context at schools, particularly Adiwiyata schools which implement the integration pattern of science-technology and environment integrally.

Keywords: integration, science, technology, living environment, Islamic education

A. Introduction

Science-technology and living environment have been hot topics in Islamic studies among academicians. They even become the central issue in the current global era. Sources of learning on science-technology and environment in the holy book Al-Quar'an are studied intensively. This is because most, if not all, topics regarding science-technology and environment are discussed in-depth in the main source of Islam's teachings, i.e. al-Qur'an (Arifudin, 2016). With this understanding, human will be brought to an awareness of their duties and responsibilities towards the environment, in this case including the effort to be done to constantly maintain the nature reservation (Hamzah, 2013). A clean and healthy environment is of course dreamt of by any educational institution anywhere and anytime. A clean and healthy school environment is also a reflection of how members of the school, ranging from students to teachers to staff to employees and finally to the school leaders, treasure hygiene. One noble character a school must internalize to their students according to Kemendiknas (2010) is environmental care. This environmental care character is an attitude and action where an individual keeps on trying to prevent the natural environment around them from being damaged and developing efforts to remidy any existing environmental damage (Wibowo & Gunawan, 2015).

One of the causes of environmental crisis is spiritual emptiness which initially begins with disorientation towards life. This disorientation towards life here can be seen in the exploitation of natural resources for the sole purpose of economic (material) benefits (Suwito, 2011). As a result, the environment is damaged, the natural balance is impaired, and the earth gets increasingly incovenient to stay in. Furthermore, imbalanced natural system and cycle, wheather anomaly, and humanity tragedy are all from environmental damage. It is clear that all these calamities are from human tendency to be greedy, be it their greed in exploiting the nature or their lifestyle and consumption pattern which are based on other than spiritualism and ecology.

The currently existing environmental crisis is actually a result of fundamental-philosophical error in the way human understands and views themselves, the nature, and their place in the entire ecosystem. This error leads to another error in how human behaves, particularly in interacting with the nature (Sumantri, 2010). The materialism, capitalism, and pragmatism through science and technology have accelerated and worsened environmental damages.

A religious scholar says that this environmental damage is a logical result of the failure to perform religion's teachings well. Likewise, Zakiah Darajat, an educator and psychologist, argues that this environmental damage is because Islam education does not or not optimally grow within those inflicting damages to the environment (Aziz, 2013). An understanding of environmental issues (fiqhul bi'ah) and their handling (rescue and preservation) is very necessary to be put on a moral foundation. This jurisprudence supplies human awareness to ensure that environmental problems cannot be exemplified from human responsibility who believe and are a mandate that must be carried out for the maintenance of the universe. This needs to be done because all the efforts that have been made and fostered so far are still not able to overcome the environmental damage that has existed and is still ongoing (Hidayat, 2015).

Therefore, it is undeniable that human is one of those causes of nature damage. If nothing is done about this, the conservation of living environment will be threatened and in turn it will severely harm the life on this earth of ours.

Islam has a clear-cut concept on the importance of environmental conservation, rescue, and preservation. However, the Islamic concept has not yet utilized optimally for real. Therefore, a comprehensive exploration should immediately be done on the Islamic concepts related to environment and their implementation and revitalization. In the perspective of environmental ethics, the most important component in the relationship between humans and the environment is human supervision. Humans have the power and opportunity to monitor and control behavior for the preservation of the environment. This is in accordance with religious goals, one of which is maintaining and protecting the environment. If environmental conditions deteriorate, the conditions of human life will also deteriorate and will have an impact on the deterioration of religion, and can even destroy the existence of life and religion as its worst impact (Harahap, 2015).

Rationally and ecologically speaking, environment preservation is an ecological necessity, i.e. the non-negotiable objective of environment. This is because human is an environmental creature. To succeed in passing their tests, they have to be able to read the natural "signs" or "verses" shown by Him, the Ruler of the Universe. Some of what human needs in order to read these God's verses include knowledge and sciences.

Islam's teaching empasizes the importance of sciences and knowledge to improve human quality of life, push progress forwards, and for human welfare (Nata, 2011). Those who wish to succeed in both the world and the afterlife or only in one of them should equip themselves with sciences and knowledge. Sciences and technology in essence come from Allah the Almighty, thus, its use should as He desires for the sole purpose of worshipping Him, i.e. using it to deal with various problems in life, manage the creation of more convenient and prosperous life, both materially and spiritually.

In Islam, it is believed that science plays an important role for human in living their life and technology constitutes an embodiment of human's systematic effort in applying or utilizing knowledge or science so that they can give human some ease and wealth. *A technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome* (Rogers, 1983). Recently, science and technology have rapidly and sophisticatedly developed. This development, in turn, causes rapid changes in everyday human life. For Muslims, the currently existing technology must be used as a motivation to think on how to prevent the existing technology from being used to inflict any damage, and on how to build human civilization instead. When humans can manage and handle the natural environment with its various available contents, as best and fair as possible, then they will be able to enjoy the benefits in a durable and sustainable manner. On the contrary, if the nature is managed in a poor, wasteful and haphazard, unfair and unbalanced manner, particularly in the form of excessive exploration, then surely the punishment of Allah and disaster will eventually come to humans (Sumantri, 2010). The science and technology advancement can give good impact if they are effectively and appropriately utilized. However, the opposite signs such as natural resources destruction, air pollution, water pollution, and noise are the indicators of technology currently.

In the context of Indonesia, the environmental damage during this past decade has given a highly critical signal. This environmental crisis occurs because humans are far from God. They are dominated by greed and keep themselves away from the moral teachings of God. This environmental crisis is due to the fact that humans interact with God's other creatures unethically. The environmental damage issue raises serious responses among the world community, including academics. Indonesia's environmental damages do not grow linearly or one by one, rather the damages to the environment occur in many ways and are caused by thousands of causes (Yafie, 2006). As God's representative on the earth this behavior is highly disgraceful. The destructive exploitation of nature has implications for the destruction of life as a whole. Humans who are mandated as caliphs on the earth have failed to regulate themselves, to maintain their own place to live in and to save the environment for the survival of their own generation and their following generations.

The environmental rescue efforts can be done by making people and stakeholders aware by passing both national and international regulations, agreement, and laws and their enforcement. The rescue through science and technology utilization as well as other technical programs are also urgently required. In this case, the youth generation needs to play their role, because they are the assets who will develop and protect this nature from any damage. Especially, as this environment damage issue is currently receiving great concerns from Indonesian people, it is urgent to deal with this increasingly critical environmental damage.

The pursuit for scientific and technological advancements must be carried out within the philosophical framework of science and technology upheld on the Islamic faith system as well as the ethical and moral systems embodied in sharia (Bakar, 1995). Otherwise, it is possible that science and technology will be misused for immoral and malicious purposes as we have currently witnessd at a surprising scale and they become instruments of greed which lead people to environmental destruction.

The obsession with science and technology while ignoring the supposedly upheld moral and spiritual values is one of the greatest misfortunes. It is quite often that science and technology do not go along with the existing values, thus new efforts are needed to build science and technology which suit religious values. One of these effort is the integration of science and religion (Islam) or harmonization between the signs He gives in the universe (*kauniyah* verses) and Qur'an verses (*qauliyah* verse). Islam commands its adherents to think a lot. Thinking makes human knows the power of God through His verses, both *kauniyah* and *qauliyah* verses and otherwise (Sunhaji, 2013).

Islam and science technology might seem, at a glance at least, distant, when actually they can be combined with the gaps in between them be fulfilled. Humans no longer live in the era of idolizing technology nor do they live in archaic zones. It is our job to be keen to see the connection between them to allow the creation of innovation. Islam should be taught flexibly with interesting inventions in science world which have actually been there in al-Qur'an and hadith. Science and technology should be viewed as great instruments to serve human spiritual and moral purposes. This way, it is expected that sciences and technology which fit Islam (laws of Allah) can be created.

Islam Religion Education or *Pendidikan Agama Islam* (hence PAI) is one of many courses which can be the basis for value development, prevention as well as morality

formation in students, particularly in those schools whose students are adolescent. PAI is one course which can be used as a foundation to give students a platform to resistant to as well as prevent them from doing immoral actions. Thus, it is expected that PAI can give its contribution in shaping a pious, faithful and skilled Indonesians to allow them to live as members of society, state and country.

PAI should be directed towards the formation of *amalus-solikhah* (good deeds), rather than merely Islamology. The affect aspect should be more dominant than the cognitive ones with an orientation of shaping piety, both individual and social piety. This piety can be formed because faith and God-consciousness are deeply rooted. Therefore, PAI learning ought to not focus merely on *tafaquh fi-dhin* (understanding religious matters), rather it needs to invite students to contemplate on the universe He create so that their faith and God-consciousness will increase. To nurture this faith and God-consciousness, one can *tafakkur* (contemplate) and *tadabbur* (ponder) on the might and creations of Allah. To do so, PAI course needs to intersect with natural sciences/nature, hence the integrative learning of PAI with Sciences and environment is an answer to the effort of realizing the final goal of PAI course. Scientifically, the process of integrating PAI course with Sciences have some reasons, including: 1) religion commands its followers to to think a lot since thinking makes human knows the power of God through His verses, both *kauniyah* and *qauliyah* verses and otherwise; 2) the content of Sciences (Physics and Biology) learning explain extensively natural phenomena and the preservation of nature, both biotic and abiotic; and 3) PAI learning is said to have succeeded when students become faithful and God-conscious. Faith in religion can occur, among other things, when one *tafakkur* (contemplate) and *tadhabur* (ponder) on nature; that this nature is His creation, and from this awareness faithful behavior occurs. One character that an individual is increasing is that they keep on performing good deed, and once this is done continuously it is called as *taqwa* (God-consiousness). Behaviors which are born from *taqwa* are referred to as noble *akhlak* (characters) (Hartono, 2011). Once faith and *taqwa* are deeply implanted, it can be ensured that a good harmony with other fellow humans and the surrounding environment will be created. It is this good harmony which essentially becomes the source for people's physical and mental welfare.

It is therefore interesting to study intensively how Junior high school in Banyumas Regency preserve their living environment by integrating Islam, science and technology. For this reason, the researcher would like to study and to conduct further research on "the Integration of Islam, Science and Technology in Preserving Living Environment which is integrated through Islam Religion Education learning in Adiwiyata schools."

B. Literature Review

The integration of Islam, science and technology with living environment integrally has three different versions on integration of sciences and religion. According to Barbour, the first version is the *natural theology* group which claims that the existence of God can be concluded from evidences regarding the presence of universe's systematic design and it is through these evidences that people will get an awareness of their role in the world. The second version is the *theology of natural* which claims that the main sources of theology reside beyond sciences. Sciences and religion are viewed as

relatively independent sources of ideas. Lastly, the third version is the systematic synthesis, i.e. it can be done when sciences and religion give a contribution towards a more coherent worldview which is elaborated within a comprehensive methaphysical framework (Barbour, 2000).

Kuntowijoyo also offers a model for integrating sciences and religion, i.e. scientification of Islam. This scientification of Islam departs from text to context (Kuntowijoyo, 2004). Scientification of Islam is a process of elaborating Muslim's normative-subjective concepts into open and inclusive empirical-objective formulations. Scientification of Islam does not perform any normative judgment, rather it utilizes knowledge from other realms to understand the normative contents of Islam (Priyono, 2008). The scientification of Islam has two methods, i.e.: integralization or combining human scientific wealth (empirical findings) and revelation (Allah's guidance in al-Qur'an and its implementation in the *sunnah* of the Prophet), and objectivication or the movement from text to context, i.e. understanding and interpreting the verses of the holy book (text) in the perspective of sciences.

Meanwhile, M. Amin Abdullah tries to put the end to religion-sciences dichotomy in pedagogical practices through rapprochement movement. This rapprochment movement can also be referred to as the scientific epistemological unification or reintegration movement (Abdullah, 2011). He intiates the new vision of scientific epistemological reintegration program: the anthropocentric-integralistic scientific webbed model, a new approach to natural sciences, social sciences and temporary humanities. Each step taken is always equipped with objective and firm religious ethic and moral bases and in continuous consideration of al-Qur'an and as-Sunnah.

In reference to these three expert opinions, it can be said that Islam as a religion and science and technology are interrelated. Furthermore, Islam, science and technology give their own contribution to each other. Therefore, the pursuit of science and technology advancements should be done within the Islamic philosophical framework of science and technology which is built on Islamic beliefs as well as the ethical and moral system as manifested in the sharia. The opinion patterns of these three experts are used by the writer as the theoretical basis in this research.

Meanwhile, our living environment is the priceless blessing from Allah for humanity depends on it. Living environment comprises the entire space and all objects, power, ciscumstance, and creatures, including humans, and their behaviors, which affect the survival and welfare of humans as well as other creatures and may influence their life. Islam desires the shaping of Islamic mentality within each individual in the society, thus they will keep on using al-Qur'an and Sunnah as the basis of everything they do. Both al-Qur'an and Sunnah are essentially requiring humans to be friendly with the nature. Hence, to manage and develop this living environment to preserve it, Islam gives human a chance to learn the knowledge as an arena to think and experiment as well as to materialize the results through technology development. Science and technology essentially play a dominant role in the nature preservation when they are effectively applied. However, it can otherwise be harmful to the environment when inappropriately applied. Therefore, science and technology should be based on al-Qur'an and hadith. The integration of rational thought into the interpretation of al-Qur'an verses is intended not only to straighten the way people reason, rather it also

serves to attract people, particularly the educated ones, to make Islam teachings as the basis in managing and maintaining the living environment to prevent its quality from declining and its loading capacity from decreasing. This is the so-called preserved environment. Thus, there is a need to integrate Islam, science and technology in preserving the living environment through some learning activities.

The integrative learning steps begin with determining what competences students will need to achieve and analyzing the context by formulating the integrative learning objectives. The teaching and learning uses webbed model by relating some themes and its application starts from initial activities and followed by explaining the description of relation during the core activity and reflecting and providing feedback on the learning when the learning ends or concludes.

C. Research Methodology

This is qualitative research with a case study approach. It is expected that using this approach will reveal the description of actuality, reality and perception of targets (Yin, 2008). The findings in the field are then verified and analyzed rationally. In a case study, the investigations are made to empirical issues by following a set of procedures which have been specified previously. This research takes three schools which represent Banyumas Regency at regency, province and national levels, namely: 1) State Junior High School 1 Kedungbanteng as the Adiwiyata school of Banyumas Regency level; 2) State Junior High School 1 Karanglewas as the Adiwiyata school of Central Java province level; and 3) State Junior High School 1 Baturaden as the Adiwiyata school of national level. The subjects of this research are school leaders and administrators consisting of Principals and Islam Religion Education teachers. For more detail, they are: 1).Principal of State Junior High School or SMPN 1 Kedungbanteng, Principal of SMPN 1 Baturaden and Principal of SMPN 1 Karanglewas. 2).Islam Religion Education teachers at SMPN 1 Kedungbanteng, SMPN 1 Baturaden and SMPN 1 Karanglewas. Technique for Collecting Data ; In-depth Interview, In this research, the interview is done intensively with the subjects, i.e. the principals as the school managers, vice principals for curriculum, and teachers. This interview is done in a guided informal manner. This method is performed to allow the interview to run smoothly and friendly and well-directed in order to explore the actually needed information related to the research topic, particularly the aspects concerning a model to integrate Islam Religion Education learning and science-technology and environment. In this interview the researcher provides an instrument guideline in the form of items for planning, implementation and evaluation of learning which are based on Adiwiyata model in the integration of science technology and living environment. Documentation The numerous data and sources of written information in the form of documents, teaching and learning report, work program, meeting minutes, letters and so forth are collected using documentation, method. Observation, The observation technique employed by the researcher is the participant observation by directly coming to the research sites while observing how teachers teach students using the PAI-Sciences integration model. Using this technique, the researcher records or takes notes on the needed data to complement the data obtained using interview and documentation techniques. The observation is made to the school where the research is done and also to their teaching and learning implementation. Focus Group Discussion

(FGD) The Focus Group Discussion is used to explore the data from various informants by establishing a discussion group specifically discussing the matters related to the research topic so that robust, in-depth, and accountable data can be obtained. Analysis in this research, the data are analyzed since the beginning of research until the research report is prepared. The data are analyzed using flow model analysis or interactive data analysis and Milles and Huberman method, i.e. the data analysis model consisting of such steps as: (1) data collection, (2) data reduction, in a sense that the obtained data are selected, summarized and focused on the issues at hand, (3) data display, systematizing data clearly in a definite form such as matrix and graphic when necessary, And (4) conclusion drawing and verification (Miles & Huberman, 1986).

This data analysis begins with the result that the researcher obtains from participant observation at the site on the implementation of science-technology and living environment integration. Then, after the data are gathered, they are described for the purpose of this research, with the irrelevant data being discarded and the relevant ones are kept to be the basis for analysis and conclusion drawing. Validity Test upon their collection, the data are tested for their validity using data triangulation technique. This triangulation is intended to discover to what extent the findings in the field are actually representative to be a guideline for analysis and also to obtain an extensive information on the research perspective. The data triangulation uses many methods or many sources for one datum, i.e. comparing the interview result to observation result, between the utterance of data source in public and when they are alone informally, between the interview result and the obtained documentation. For the purpose of data triangulation, check and recheck as well as cross-check are made with various subjects or sources of research.

D. Research Findings

1. Integration of Islam and science-technology through PAI learning at schools

The integration in this context means making al-Qur'an and as-Sunnah as the grand theory of knowledge. According to Trianto, the term integration is synonymous to unification, combination of two or more objects (Trianto, 2014). Inside it, *qauliyah* and *kauniyah* verses are used to deal with the problem of dichotomy. Integration requires a vehicle as its socialization space. Integration is the grand dream of Muslims towards the highest truth, i.e. empirical truth which symbolizes the might of Allah as the creator of everything. The integration of science and religion in Islam becomes highly interesting since Islam has great potentials to be an alternative development towards new sciences or knowledge (Hartono, 2011). Al-Qur'an can be sources or objects of establishment and development of sciences in the effort of improving faith and human welfare. The command which depicts the tight the relationship between Islam teachings and sciences and knowledge which derives from this universe is QS 10: 101.

In their teaching and learning, an integrative model is used. This is a teaching and learning model which deliberately relates several aspects between the courses being integrated (Fogarty, 1991). Using this integrative model, students will obtain knowledge and skills as a whole, making the teaching and learning meaningful to students. The term meaningful here means students indirectly learn and comprehend the concepts they learn through direct and real experiences which relates the concepts between the

integrated courses. Such model is far more effective in improving students' understanding and application of values than the conventional approach which is monolithic (Rubiyanto & Haryanto, 2010).

Integrative teaching and learning gives greater emphasis on student's active involvement in learning. This is as what is expected by constructivism learning theory which desires that students learn according to their experiences. Learning according to this theaory is the hard effort which is highly personal. Teachers act as a facilitator who convinces students to find principles themselves and construct knowledge by solving realistic problems. Thus, teachers are demanded to design and implement a learning experience program effectively. The effectiveness of the program designed by teachers in the teaching and learning becomes the key to student's success in the society. Therefore, using integrative teaching and learning model it is expected that student's knowledge and comprehension will be more integral and holistic.

In essence, the integrative teaching and learning model is a teaching and learning system which enables students, both individually or collectively, to actively find, explore and invent scientific concepts and principles holistically, meaningfully and authentically (Fogarty, 1991). Any teaching and learning implemented separately or non-contextually to student's world will cause students to develop less optimally to think holistically and make them hard to relate the concepts with their own daily real life. As a result, students fail to grasp the benefit of materials they learn for their real life. Such a educational system generates a human being who thinks partially and fragmentedly. Below is the themes of Islam Religion education courses in SMP related to sciences in its teaching and learning.

Table 1: Relationship between PAI Themes and Sciences (Physics, Chemistry & Biology)

PAI Themes	Sciences Themes
1. Creation of universe/natural events in the universe (the sun, the moon, planet (Q S.Ar-rum: verses 41-42)	1. Physics: Revolution of the sun, the moon, and planet in their orbit
2. Ways to be grateful to God for the blessings He gives in the form of all of His creations (QS. Ibrahim verse 7,QS Yassin verses 33-34, QS Al-A'rof verse 98)	2. Biology: creation of human, God's creaton of the earth and everything on it for humans as *kholifalullah fil ardhi'*
3. Animal, plant and human biological life (QS. An-Nahl verses 66-69, QS An-Nur verse 45, QS Al-mukninun verses 12-14)	3. Chemistry: alcoholic beverage process, Honey can be medicine and embriology
4. Ways to make environment-care a habit (QS Al-A'rof verse 56-59)	4. Physics: natural events, Chemistry: sources of energy, layers of earth, Biology: flora and fauna life and nature preservation.
5. Learning/seeking for knowledge & technology dalam Islam	5. Physics: revolution of the sun, the moon, planet in orbits, Biology: creation process of human & animal and plant, Chemistry: Inside the nature etc.

In its implementation at schools, the science-technology and Islam Religion Education integration model is urgently required to eradicate the scientific dichotomy which has so far been a gap separating sciences and religion. Additionally, the integration of science-technology and religion teaching and learning also constitute a form of implementation of values in Islam which has intensively and comprehensively discussed science-technology issues in Islamc studies on what are contained in the holy book al-Qur'an.

2. Integration of Islam, Science-Technology and Living Environment in Preserving the Environment through PAI Teaching and Learning in Adiwiyata-based SMPs in Banyumas

The integration of Islam, science and technology in preserving the living environment at Adiwiyata SMPs in Banyumas is an interrelated, comprehensive process. One method of preserving the living environment in practice at schools is by performing an integrated activity combining Islam, science-technology and environment in its teaching and learning.

The integration model of Islam, science and technology in preserving the living environment as integrated in Islam Religion Education teaching and learning is done by applying an integrative teaching and learning model. As an illustration, the implementation in Islam Religion Education learning for sub-theme Al-Qur'an Hadith and *Aqidah Akhlak* has subtopic on maintaining the living environment. In its teaching and learning implementation, the teacher relates Islam to sciences and technology based on the existing phenomena which in this case are related to the preservation of living environment. As the researcher observes, during the Islam Religion Education teaching and learning when delivering the content, the discussion is guided towards sciences, beginning from physics, chemistry, biology and technology which are all directed further to the preservation of living environment. In delivering the content, teacher relates one course to another continuously. The PAI and Science-Technology integration teaching and learning model can be seen in the following figure:

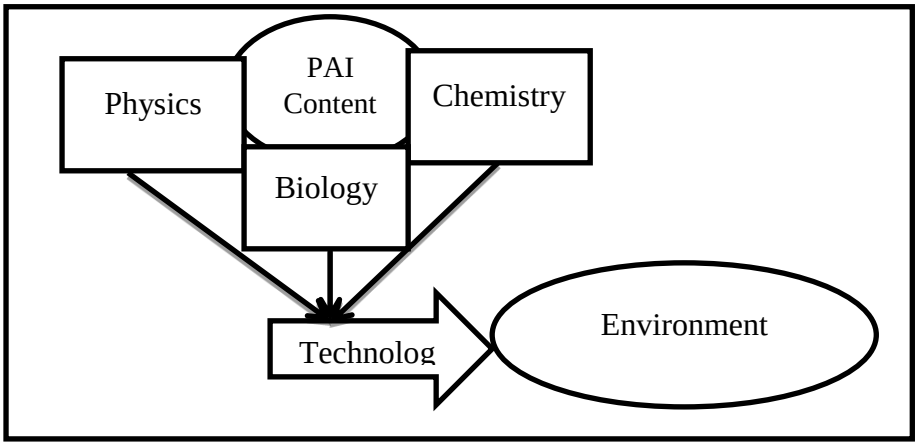

Figure 1: PAI and Science-Technology integration teaching and learning model

From the figure above, it can be seen that the steps in integration taching and learning are: determining student's ability or competence and analyzing the context by

formulating the integration teaching and learning goals. As to how the integration teaching and learning are implemented from the perspective of PAI teachers, as explained by PAI teacher of SMPN 1 Karanglewas, it begins with the delivery of *tawhid* theme and worshipping, i.e. *salat* or prayer, as a gift from *Isro' Mi'roj* event and commanded by Allah SWT. From the perspective of sciences, for example Physics, it is explained how the sun, the moon and the earth rotated when this *Isro' Mi'roj* took place. Furthermore, from Chemistry perspective, it is described how elements of nature influence people's life, in this case when the *Isro' Mi'roj* event took place. Finally from biology perspective, an explanation is given about how to maintain and keep the hygiene in performing *shalat* to keep oneself clean and hygienic. Upon its identification from the perspectives of PAI and sciences, it is then drawn to technology, i.e. to maintain hygiene one can now use many tools produced by today's increasingly sophisticated technology.

The teaching and learning process uses webbed model by connecting some themes and is applied by introducing a theme at the beginning, followed by some explanation on this connextion during the core activities and reflection and feedback of teaching and learning at the end or concluding activity. This way, the syntax of the science and religion integration teaching and laerning can be found and the result can be analyzed.

On the other hand, through the Adiwiyata program, students at SMPNs in Banyumas integrate Islam, sciences and technology to preserve the living environment. They integrate them by understanding of al-Qur'an and the Prophet's hadith texts and then bringing them to application realm through sciences and manifesting them through technology. This way, one integral comprehensive understanding and practice can be obtained. The chief of Adiwiyata Coach teacher team, states as follows: As Muslims, our main guideline is of course al-Qur'an and then hadist. In terms of keeping the environment clean, there is one hadith which states "*annadzofatu minal iman*" or hygiene is part of faith. Therefore, we have actually been demanded to maintain hygiene. Well, we have indeed tried to constantly our environment clean, particularly around the school. In relation to environment preservation, an example is when we do the *wudhu* or ablution using water, the used water is channeled to a pond where many fish are kept. It is then followed by the utilization of technology in the form of a machine to water the plants around the school. This constitutes an effort to circulate the water in an environment preservation model to grow and refresh the plants.

From understanding the texts in al-Qur'an verses and hadith, then observing the surrounding environment, it is found that human has great responsibility to the surrounding environment. This is because it is stated in al-Qur'an that humans serve the purpose of being a *caliph* or God's representative on earth tasked to maintain the universe which iis created by Allah. These SMPNs in Banyumas as Adiwiyata schools have their Adiwiyata program basic principles, namely: (1) partisipatory, i.e. the school community is involved in the management which includes the entire processes of planning, implementation, and evaluation according to their responsibilities and roles and (2) sustainable, i.e. all activities should be continuously done in a well-planned and comprehensive fashion (Adiwiyata Document). Thus, the integration model of Islam, science and technology in preserving the living environment in SMPNs in Banyumas through their Adiwiyata program is intended to motivate and enlighten students which

departs from texts and then apply them in the daily life context as an effort of preserving the surrounding environment of SMPNs in Banyumas.

E. Discussion

One topic of Islam Religion Education learning at junior high schools which have something to do with human's task as a *caliph*, i.e. keeping the living environment preserved. The actualization of living environment preservation program in human life requires sciences and technology as the motor and developer. Hence, in Islam Religion Education learning, teachers constantly relate Islam to science and technology to let them go side by side and give contributions to each other at the appropriate portion. This is also consistent with the theory quoted by Abdullah (2011) on integration of religion and science, i.e. theo-anthropocentric-integralistic scientific webbed epistemological reintegration model. This concept depicts a religious (Islam) human being who is skilled in handling and analyzing the issues on humanity and religion problems in these modern and post-modern eras by mastering many new approaches and natural, social and contemporary humanities sciences. According to this analysis, in teaching and learning teachers do not monotoneously teach Islam Religion Education topics, rather they are integrated with other disciplines, especially sciences including Physics, Chemistry, Biology and finally with technology. This way, the beliefs which come from Islam teaching can be developed through sciences and then manifested by technology which can be helpful in preserving the living environment. These SMPNs in Banyumas endeavour to put an end to scientific dichotomy using an integrative teaching and learning model which relates Islam with science and technology and it is directed towards the preservation of living environment.

In each Islam Religion Education learning activity, the curriculum is added with environment-care aspect which is integrated with sciences and technology. In Islam Religion Education learning, the teachers always relate the role of Islam to other disciplines, i.e. that Islam can go along perfectly without ignoring other studies, that Islam has some connection with sciences and technology. This is because they essentially need each other.

More specifically, the integration between PAI (Islamic Education) and Science are due to several following important reasons: (1) Science will have a very large impact on the welfare of human life if accompanied by the principles of faith and devotion to God, and on the contrary, without both principles, science can be misused by destructive purposes, which may threaten human values and make it only a scientific method without any meaning for human life; (2) In reality, science, which is the basis of modernism, will create new patterns and lifestyles that are secularistic, materialistic and hedonistic if it is not followed by the values of faith and devotion and may result in fatalistic life; (3) If there is a gap between both aspects, there will be no balance and equality in life and this does not meet the essence of God's intention of the creation of mankind, which covers the unity of the physical body and the soul, the world of life and the hereafter; and (4) Science will be a strong foundation for human to reach happiness. Without Science the worldly sciences are difficult to create. However, any progress and achievement will only produce mirages that do not promise anything other than false dreams if it is not based on faith and seeking the pleasure of God (Sunhaji, 2016). For that reason, the integration of PAI and Science must be arranged in

the appropriate format to create the balance of both aspects as well as happiness and goodness of human being in the world (*hasanah fi-dunya*) and in the hereafter (*hasanah fi al-akherat*).

Teachers explain that in Islam humans are commanded to preserve the nature. In its implementation, teachers also explain what are implied in Surah ar-Ruum verse 41, i.e. the suggestion, which is also a warning at the same time, to maintain the environment to prevent themselves from any misfortune since the one causing this misfortune is human themselves.

Teachers relate the topics in Islam Religion Education course with sciences as viewed from the perspectives of Physics, Chemistry, and Biology as well as technology to allow the establishment of coherent relationship between them just as previously stated, according to the theory from discipline integration expert Amin Abdullah. However, teachers are not allowed to let their guard off and be quickly satisfied. They have to keep on integrating the interrelatedness between Islam studies and other disciplines. In integrating them, it is important to keep on emphasizing the unity, rather than the difference, between them in order to eradicate dichotomy or separation of sciences. The integrative paradigm, will be able to bridge the sharp gap between general education and religious education, many institutional-scientific and methodological problems. As a result, this institution has not been able to completely solve the problem of scientific dichotomous dualism, functional problems of "cultural heritage", and the dominance of indoctrinative justification methodologies in academic activities (Arif, 2008). In addition, the paradigm of an integrative Islamic education will give birth to an inclusive attitude, so that it will not respond to developments with reactionary ways or make it as the living ground of radicalism.

This is because everything out to be side by side and in essence they are indeed close to and in mutual need of each other. This is true especially in the effort of preserving the living environment of which the command has been clear as day in al-Qur'an and for one to be able to apply it, sciences and technology are needed as the vehicle. As a further implication of this integration concept, these Adiwiyata-based SMPNs in Banyumas establish a Adiwiyata School coach team which is tasked to explain to students the teaching of Islam in relation to sciences and technology in their implementations to maintain the living environment, to organize an environment cleaning each week, to form a team of Adiwiyata coaches who supervise and monitor students to continuously perform the teachings of Islam, particularly in maintaining the environment and also all elements of the school who share the obligation of keeping the school environment, to procure posters around the school which promote and advocate the environment preservation effort, to commemorate the eart day by performing reforestation and no-smoke day, to provide three-type rubbish bins, i.e. red for hazardous wastes, ember for non-organic wastes, and green for recycleable wastes. In this case, the organic wastes include leaves which can be fertilizers when they are processed in some stages and it should be continuous. In addition, non-organic wastes such as mineral water bottle, can be used as pots, allowing them to be useful for environment preservation.

The implementation of Islam, science and technology integration in preserving the living environment through Adiwiyata program, in general, has been consistent with the theory, i.e. it is mentioned that in Surah ar-Ruum verse 41 that the natural damages both in

the land and the sea are caused by humans, thus they reap what they sow which, in turn, should make them aware of this damage and think of a way to preserve their surrounding nature. This means the Adiwiyata program of SMPNs in Banyumas promote the preservation of living environment in many ways which are implemented to support the the preservation of living environment.

Judging from the activities which have been programmed and implemented through this Adwiyata program, it is safe to say that the program are all-encompasing for the activities done have been that many and involve all elements within the schools and most importantly they are always geared up to march forwards towards the preservation of living environment in combination with the integration of Islam, science and technology in its implementation. Humans *are* the executors of integration of Islam, sciences and technology in preserving the living environment. This is because humans serve the purpose of being a *caliph* on the earth with their knowledge. Without knowledge, it is them who are controlled by the nature instead. The environment is a part of the integrity of human life. Therefore, it must be viewed as one of the ecosystem components that has values to be respected, valued, and not hurt. This integrity causes every human behavior to influence the surrounding environment. Positive behavior can cause the environment to remain sustainable, while negative behavior can cause the environment to be damaged. This integrity also causes humans to have a responsibility to behave well with the life around them. When they master sciences, knowledge and technology (IPTEK), to some extent, they will be the one to decide what the nature should do and hence they can preserve the nature. Humans assume the responsibility to preserve the nature by developing their sciences and technology.

F. Conclusion

Islam has a clear-cut concept on the importance of conservation, rescue, and preservation of environment. Yet, this concept in Islam has not been optimally utilized. Therefore, it is urgent to explore comprehensively the concepts of Islam which deal with environment and the effort to implement and revitalize them. The integration model of Islam, science and technology in preserving the living environment which is integrated in Islam Religion Education learning activities is one of those efforts of making the society aware of this mater through education. This effort constitutes one of many vehicles to eradicate the dichotomy between general knowledge and religion which has so far been separating the two. Additionally, in essense Islam Religion Education course is the soul of science and technology, especially the environment. One of synergetic school programs is Adiwiyata. This Adiwiyata program is the implementation of Islam, sciences-technology and environment integration.

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