

Integration of Islamic education with science and technology in Islamic junior high school

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Abstract

The integration of Islamic education with learning of science and technology is expected to be meaningful and easily understandable so that the goal of Islamic education in leading the students to recognize, understand, contemplate, believe, be piety, and have noble character in implementing the teachings of Islam from the primary source i.e. the holy book of Al-Quran and Al-Hadith through the teaching guidance, practicing, and the use of experience can be accomplished. The key of the integration in controlling and restoring science and technology to its original position, namely: *amar ma'ruf, nahi munkar*, and having faith in God. This study aims to determine the integration of Islamic education with science and technology in SMP Islam Al-Azhar 21 Solo Baru. By using qualitative descriptive method and also through triangulation technique to test the validity of data, the study is also aimed to search and arrange systematically the data obtained. The data is taken from interviews, field, and documentation by organizing data into categories, describing them into units, synthesizing, preparing into the pattern, classifying the important things that will be learned, and then making a conclusion. From the results of the study, it can be concluded that the observation result of creativity of the students showed that the smooth aspect of the students who have excellent category is 41.28% and the results of the flexibility aspect of the students who have excellent category is 36.69%. The observation results indicate that the detail aspect of the students who have excellent category is 33.98%.

Keywords: Islamic Education, Science, Technology

Abstrak

Integrasi pendidikan agama Islam dengan sains dan teknologi pembelajaran yang dilaksanakan diharapkan menjadi lebih bermakna dan mudah dipahami. Sehingga tujuan pendidikan agama Islam dalam mengarahkan peserta didik untuk mengenal, memahami, menghayati, hingga mengimani, bertaqwa, dan berakhlak mulia dalam mengamalkan ajaran agama Islam dari sumber utamanya yaitu kitab suci Al-Quran dan Al-Hadits, melalui kegiatan bimbingan pengajaran, latihan, serta penggunaan pengalaman dapat terlaksana. Kuncinya dalam mengendalikan dan mengembalikan sains dan teknologi ke posisi semula, yaitu: amar ma'ruf, nahi munkar, dan iman kepada Allah. Penelitian ini bertujuan untuk mengetahui integrasi pendidikan agama Islam dengan sains dan teknologi di SMP Islam Al-Azhar 21 Solo Baru. Dengan menggunakan metode deskriptif kualitatif, melalui teknik triangulasi untuk menguji keabsahan data, yaitu mencari dan menyusun secara sistematis data yang diperoleh dari hasil wawancara, lapangan, dan dokumentasi dengan cara mengorganisasikan data ke dalam kategori, menjabarkannya ke dalam unit-unit, melakukan sintesa, menyusun ke dalam pola, mengklasifikasikan hal-hal penting yang akan dipelajari kemudian membuat kesimpulan. Dari hasil penelitian disimpulkan bahwa: hasil amatan kreativitas pada peserta didik menunjukkan bahwa untuk aspek kelancaran pada peserta didik yang memiliki kategori baik sekali sebesar 41.28%. Hasil amatan menunjukkan bahwa untuk aspek fleksibilitas pada peserta didik yang memiliki kategori baik sekali sebesar 36.69%. Hasil amatan menunjukkan bahwa untuk aspek kerincian pada peserta didik yang memiliki kategori baik sekali 33.98%.

Kata kunci: pendidikan Islam, ilmu pengetahuan, teknologi

Introduction

The development of science and technology in this era is rapidly developed and it is increasingly needed by humans. Modern humans have heavily relied on science and technology products. It is hard to imagine

that modern humans are living without science and technology products. The needs of modern humans in daily life from eating, drinking, sleeping, sheltering, working, transportations, communication devices, entertainments, medical care to all aspects of human life can not be separated from using science and technology products.

The development of agricultural technology, livestock, fishery and food and beverage processing has made it easier for humans to fulfill all human beings on earth. The development of information technology by using telephone, mobile phone, facsimile, internet and others, has accelerated the delivery of information that once took it up to months, now it can get to the precise destination in just a few seconds, even at (almost) the same time. By utilizing TV, satellite and other sophisticated communication devices, an event in a particular place on earth or in space near the earth can be easily known at the same time by human beings all over the world.

Science and technology have indeed taken an important role in the development of human material civilization. The inventions of science and technology have given humankind many conveniences. The journey that had to take months now can be taken only a few hours by plane and fast train. Other inventions that are very different also have made easier and fun way of human life today than ever before.

Islam, a religion that is in accordance with human nature, its Shari'ah does not only encourages people to study science and technology, then build and nurture civilization, it even organizes its people in the direction to survive and save well in the world even more in

the Hereafter (Puspita, 2007: 15).

But until now, there is still a strong assumption in the wider community that religion and science are two entities that can not be reconciled. Both have their respective territories, separated from one another, in terms of formal-material objects, research methods, truth criteria, roles played by scientists. There is another phrase that is said science does not care about religion and religion does not care the science. It is because the assumption that science and religion have different ways from approaches, experiences. This difference is a source of debate. Science is closely related to a very abstract experience, such as mathematics while religion is more closely related to the ordinary experience of life. As an interpretation of experience, science is descriptive and religion is prescriptive.

There is also a view that science and religion stand in their respective positions, since the field of science relies on empirically supported data to ascertain what is real and what is not, religion is otherwise ready to accept the unseen and uncertain based solely on the tangible variables of faith and trust. Religion and science must co-exist independently of one another, for although there are similarities in their mission, the fundamental difference between the both of them is a conflict that will resonate at each core. Thus the integration between science and religion is almost unfeasible, as a scientific criterion for identifying such assumptions becomes real, because there is certainly a process of cannibalization between them both, while religion is essential to the well-being of the individual and aims to create harmony for life.

This research seeks to find out how: 1) the integration of Islamic education with science and technology; 2) Islamic education efforts in facing the negative impacts of science and technology; 3) the results of observation on integration of creativity learning in Islamic education with science and technology. Starting from the research problem, the objective that will be achieved in this study is "To know the integration of Islamic education with science and technology at SMP Al-Azhar 21 Solo Baru".

The benefits that will be achieved is to be a contribution and enrich the repertoire of Islamic thought in general and for the community in particular. The result of this study is expected to be useful as a consideration for the community in providing or implementing an education either through formal institutions, informal or non-formal.

Research Methods

This research is a qualitative descriptive research that prioritizes data research or problem reality based on the disclosure that has been explored and disclosed by the respondents. Data are collected in the words form, pictures and not numbers. (Moleong, 2008: 4). In other words qualitative method is a research process that produces descriptive data in the form of written text or oral words of the people and behavior observed. The approach used in this research is qualitative descriptive research approach.

This research will be conducted in SMP Islam Al-Azhar 21 Solo Baru Sukoharjo district which takes academic year of 2013/2014. This location was chosen because the school applies a varied learning that is

the integration of Islamic education with science and technology. Subjects in this study are the students of class VII and teachers of Islamic Education (PAI). The informant in this research is the Head of SMP Islam Al-Azhar. The data collection techniques in this study are 1) interview, the conversation with a specific purpose made by two parties, the interviewer and interviewee. (Moleong, 2008: 186); 2) Observation, which is a complex process of observation and memory, a process composed of various biological and psychological processes (Hadi in Sugiyono, 2006: 203); 3) Documentation as a form of supporting research results from interviews or observations to be more credible (Sugiyono, 2006: 329).

The technique of data validity uses triangulation, which serves as an alternative and validation (Denzin, 2000: 5). In triangulation, researchers disseminate different methods such as interviews, census data and documents to validate findings. But this method carries the same domain assumption. For Denzin (2000: 391) triangulation has four basic types: 1) Data triangulation; the use of various data sources in the study; 2) Investigator triangulation; the use of several different researchers; 3) Theory triangulation: the use of multiple perspectives for the interpretation of data in a set of data; 4) Method triangulation; the use of several methods to study a problem. The basic types of triangulation that will be used in this study are data triangulation and method triangulation.

Data analysis technique is the process of systematically searching and arranging the data obtained from interviews, field notes, and documentation by organizing data into categories, describing into units,

synthesizing, organizing into patterns, classifying important things that will be studied and making conclusions, so that it is easily understood by researchers and by readers (Miles & Huberman, 1992: 16). From the explanation above, it can be concluded that there are three techniques of data analysis conducted in this qualitative research i.e. 1) data reduction; 2) data presentation; 3) conclusion or verification.

Discussion

Understanding the Integration of Islamic Education and Science

In the dictionary of junior high school student, the word of integration is unification, which is done until it is united or completed. (Hardaniwati et al, 2003: 251-252). According to Khudori Sholeh (2007: 231), Islamic education has initiated integration from Madrasah Ibtidaiyah to Higher Education, through religious materials such as tafsir, hadith, fiqh, and so on, which is associated with modern disciplines, so that there is integrated interconnection between science and religion. However, the process merely links the religious materials and science without an established philosophical foundation. So the provision of science and religion does not provide a comprehensive understanding of the students.

This study aims to understand the integration between Islamic education with science and technology in order to give full comprehension to the students about the subjects of Islamic education which is often dogmatically delivered by putting aside the facts of science and technology. So that between Islamic education and science can support each other in providing a complete understanding to students.

In addition, the development of information technology can be developed through the learning models and useful in the teaching process and learning activities. It is to facilitate the delivery of information about Islamic education to students. It certainly must also be supported with adequate human resources in the mastery of science and technology.

Islamic Education

Definition of Islamic education according to Ahmad D Marimba, (1984: 23), is the inheritance and development of human culture that is sourced and guided by Islamic teachings as embodied in the Qur'an and Sunnah Rasul, which is intended in order to form the main personality according to the Islamic rules. Thus the distinguishing feature of Islamic education with others is on the use of Islamic teachings as a guide in the process of inheritance and the development of the human culture (Hasbullah, 1999: 9). While Haidar Putra Daulay (2004: 3) states that the essence of Islamic education is creating the human aspires, so that Islamic education is the process of human creation which is aspired by Islam.

From some of the above definitions, it can be taken a definition that the meaning of Islamic Education is an activity or an effort of action and planned guidance which is consciously and deliberately done that leads to the building personality in accordance with the norms determined by religious teachings based on Al-Quran and Al-Hadith, through the activities of teaching guidance, practice, and the use of experience, which aims for people to have strong beliefs and have a life guide in order to grow the personality through various efforts.

Zakiah Daradjad (1995: 172) argues that in the special

methodology of Islamic teaching aims to build a religious man, which means that human beings are able to carry out the Islamic teaching with good and perfect, so as it reflects on the attitude and actions in all their life, in order to achieve happiness and glory of the world and the hereafter, which can be fostered through intensive and effective religious teaching.

From the above opinion it can be concluded that the goal of Islamic Education is as an effort to direct and guide people in this case students so that they can become human beings who believe and piety to Allah SWT, and improve understanding, appreciation, and application of Islam teaching, so they can be Muslims who are noble in life personally, socially and nationally and become a faithful person to death in the state of Islam, as the Word of Allah SWT in the Qur'an Surah Ali Imran 3: 102.

يٰۤاَيُّهَا الَّذِيْنَ ءَامَنُوْا اتَّقُوْا اللّٰهَ حَقَّ تُقَاتِهٖ وَلَا تَمُوْتُنَّ اِلَّا وَاَنْتُمْ مُّسْلِمُوْنَ (۱۰۲)
“O you have believed, fear Allah as He should be feared and do not die except as Muslim (in submission to Him)”.

To achieve the goal of Islamic education according to Amin Abdullah (in Mul Khan et al, 1998: 56) there are three stages, namely: 1) establish the cognitive aspect by transferring the knowledge of religion as much as possible to the students; 2) affective aspects, namely the process of internalization of religious values in religious education so that it is integrated in the attitude of students, as a form of follow-up of cognitive aspect; 3) psychomotor aspects, which in this stage more emphasizes the students ability to be able to foster their motivation so they can move, run and obey the basic values of religion that has been internalized through

affective aspects.

While the scope of Islamic Education covers harmony, synchronization and balance between human relations with Allah SWT, human relations with human beings, and human relations with him/herself, as well as human relations with other creatures and the environment. The scope of Islamic Education is also identical with Islamic Teaching aspects because the material contained therein is a complementary blend with each other. When viewed from the aspect of the discussion then the scope of Islamic Education commonly implemented in schools are:

Teaching of faith/iman

Faith teaching means teaching and learning process about the aspect of belief, in this case of course belief according to Islamic teachings, the core of this teaching is about the pillars of Islam.

Teaching of moral/akhlak

Moral teaching is a form of teaching that leads to the creating the soul, how to behave individually in life, this teaching means the process of teaching and learning in achieving the goal so that the students who are taught have good morals.

Teaching of worship/ibadah

The teaching of worship is the teaching of all forms of worship and the procedure of implementation, the purpose of this teaching is expected the students are able to perform the worship properly and correctly and also know all forms of worship and understand the meaning and purpose of worship.

Teaching jurisprudence/fiqh

The teaching of jurisprudence is the teaching which conveys material about all forms of Islamic law derived from Al-Quran, *sunnah*, and other *syar'i* propositions. The purpose of this teaching is for the students to know and understand about the Islamic laws and implement it in everyday life.

Teaching Quran

Teaching Quran is teaching that aims to enable students to read the Quran and understand the meaning of the content contained in every verse of the Qur'an. However, in practice only certain verses are included in the Islamic Education materials that are adapted to the level of education.

Teaching of Islamic history

The purpose of teaching of Islamic history for the students is to know about the growth and development of Islam from the beginning to the present day so that students can know and love Islam.

Science and Technology

Definition of science according to Agus S. is taken from the Latin word *scientia* which literally means "knowledge". Sund and Trowbribe formulated that Science is a collection of knowledge and processes. While Kuslan Stone mentions that Science is a collection of knowledge and ways to obtain and use the knowledge. Science is a product and process that can not be separated. "Real Science is both product and process, inseparably joint".

Science as a process is a step taken by scientists to conduct an

investigation in order to seek explanations of natural phenomena. These steps are to formulate problems, formulate hypotheses, design experiments, collect data, analyze and ultimately conclude.

Meanwhile, according to the language dictionary as quoted by Abdurrahman R Effendi and Gina Puspita (2007: 2) science is a systematic knowledge that can be tested or proven its truth. It is also a branch of knowledge based solely on truth or reality, such as physics, chemistry, biology, astronomy, including more detailed branches such as hematology, entomology, zoology, botany, cardiology Meteorology, geology, geophysics, exobiology, hydrology, aerodynamics (air flow science) and so on.

While technology is an activity or study that uses science for practical purposes in industry, agriculture, medicine, trade and others. It can also be defined as a method or process of handling a technical problem based on advanced scientific studies such as using electronic equipment, chemical processes, manufacturing, sophisticated machinery and others (Effendi & Puspita, 2007: 2).

Science and technology become an integrant of whole that cannot be separated because they support each other. Technology is part of a science that develops independently, creating a world of its own. But technology is unlikely to develop without science. So science and technology become an integrant of whole that cannot be separated.

Research Findings

Integration of Islamic education with science and technology

Based on the objectives and scope of Islamic education described above, it is expected that the integration between Islamic education with science and technology can improve understanding and consolidation for students. As Pak Musthofa begins the teaching and learning process by reading Q.S. Al-Anbiya '21: 19 together with the students, the verse in Qs. Al-Anbiya '21: 19 is as follows:

وَلَهُ مَنْ فِي السَّمَاوَاتِ وَالْأَرْضِ ۚ وَمَنْ عِنْدَهُ لَا يَسْتَكْبِرُونَ عَنْ عِبَادَتِهِ وَلَا يَسْتَحْسِرُونَ (١٩)
“To Him belongs whatever is in the heavens and the earth, and those who are near Him do not disdain to worship Him, nor do they become weary.”

The learning PAI strategy used in SMP Islam Al-Azhar 21 Solo Baru on the material of Faith in the angels and children devotion to parents was the method of clarifying the heart. The reason is that the learning of Aqidah Akhlak on the material of Faith in the Angels and the children devotion to parents using a scientific approach. It is not possible that students have to observe the obedience of the Angel to Allah. This method was done as an effort to activate students in the learning because the students' mindset when they learn PAI on the component of *Aqidah Akhlak* the teacher certainly talks and explains much more than the students so that students are not actively involved in learning.

Strategy by using clarifying the heart in learning PAI on the component of *Aqidah Akhlak* in SMP Islam Al-Azhar 21 Solo Baru conducted by Pak Musthofa, S.Pd.I by explaining six basic principles of faith as well known to Muslims which is one of precious things that can clear one's heart and mind (Nasution, 2005: 125).

First: the principle of tawheed

Tawheed is interpreting faith in Allah, in understanding this principle it tries to introduce discourses related to conscience, wisdom, integrity, tranquility, sensitivity to change, instill trust, and intuition and source of motivation. By knowing this, a person will be able to build principles in soul. Understanding the meaning of *Tawheed* is not just to know the meaning of *lafzhiyah* (textually), that is *la ilaha illallah*, but it must be deep again, that makes the meaning of *Tawheed* as a motivator or activator to try and effort. A *Tawheed* sentence should not only be treated as a display and wall decoration to drive out demons and jinns, but also as ideologies in effort. There are several aspects that must be understood to make *Tawheed* as a motivation to effort, namely:

Aspects of Uluhiyah

In effort, this aspect makes absolutely Allah as the main motivator; he works because it has a sincere intention to serve Allah, not to serve "something" other than Allah. If someone is devoted to an existence other than Allah, everything that he/she efforts will not be eternal and easily lost. However, if someone makes Allah as the motivator and place of dedication in life, he/she will continue to work and effort until the end of life.

Aspects of Rububiyah

In effort, someone absolutely makes Allah as protector. It is Allah Who gives guidance and help wherever it is and strives. It is Allah Who keeps the heart to keep in good efforts and in His favor. In addition, this aspect

gives someone to be not afraid of anything that will be faced because Allah always protects.

Aspects of Mulkiyah

Someone is absolutely only bounded to Allah SWT in his/her effort, not to superiors, leaders or others. Allah is the destiny of his/her life. Verily, my prayer, my worship, my life, and my death are only for the God of the Universe.

By living up to these three aspects, it will make Allah a motivator, protector, and place dependent, because *Tawheed* is a solid foundation in navigating the various storms of failure. With *Tawheed*, one will respond to failure as a trial that must be traversed and then improved, and success as a test that must be lived then improved its quality.

Second: principle of obedience

The principle of obedience is interpreted by faith in angels. This principle is the pillar of faith as well as the second foundation after the principle of *Tawheed*. This angel principle can build a powerful heart in achieving success in world and hereafter. Angels as creatures who have unequal allegiance, effort maximally and earnestly, are not negligent at all, very disciplined and never make mistakes.

With the principle of angels, someone will work or effort earnestly wherever he/she is. In the work or effort not because they want to be seen by people or just because of the salary factor, but they see that the work or effort is a sacred duty from Allah that should be done as well

and honestly. If the principles of angels is practiced in the life of workers; the name of corruption, manipulation, and cheating will not happen, because it is sure every human's heart known by the scribal angel namely *Kiraman katibin*. As the word of Allah in Qs. Al-Infithar 82: 10-12.

وَإِنَّ عَلَيْكُمْ لَحَافِظِينَ (١٠) كِرَامًا كَاتِبِينَ (١١) يَعْلَمُونَ مَا تَفْعَلُونَ (١٢)

“And indeed, (appointed) over you are keepers [10] Noble and recording [11] They know whatever you do [12]”

If the principles of angels adorn the soul, for him Allah will always guard him from any direction and until whenever. The evil spirits that sweep through the glittering treasures and the seductive positions and powers will not dim the emanated light from the soul that is always close to Allah.

The principle of truth

The principle of truth interpreted by faith in the book of Allah, al-Qur'an; was revealed on the 17th of Ramadan which is Qs. Al-Alaq 96: 1-5 whose contents are the command of reading, as for the following verse:

(الَّذِي عَلَّمَ بِالْقَلَمِ ٣) أَقْرَأْ وَرَبُّكَ الْأَكْرَمُ (٢) خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ (١) أَقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (٤) عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ (٥)

“Recite in the name of your Lord who created [1] Created man from a clinging substance [2] Recite, and your Lord is the most Generous [3]Who taught by the pen [4] (He has) taught the human being what he did not know [5]”

The word *iqra'* comes from the word *qara'a*. It does not simply mean "to read", but it can also mean "convey", "collect", "compile", "contain" and "research". In addition the *iqra'* command on *Surah Al Alaq* is not coupled with a particular object, such as reading "what".

Thus, it is no exaggeration to understand that the command of reading is not only in the written context but also in reading other objects, which is the universe and the vast and complex life.

Third: principles of leadership

The principle of leadership is interpreted by faith in the Apostles. The power of a person's heart is measured, which is when he/she is able to pay attention to others, because this character that puts sympathy instead of antipathy. For him, the most important thing is to invite others with courtesy even when they are repaid with bitterness and discomfort. Someone who applies the principle of leadership in his life by imitating the apostles of Allah will always present a gentle character, and because of this character, many people love him. Therefore a leader is respected not because of things that are as short term as position, property and others, but it is because of the noble morality.

This fourth principle by imitating the morality of the apostles if practiced in everyday life, it will create true love, not love for a moment that is love to Allah, the universe, people, and life.

Fourth: the principle of the future

The principle of the future is the principle that is interpreted by faith to the Final day. The strength or clarity of a person's heart can also be measured from the extent of his success through various processes of life with patience. He believes that every thing that is done as small as any will get a reward. Unsuccessful thing in the world is not considered with

despair because convincing everything that has been done; it will get the reward if it is done with all the heart and sincerity.

Believing in the final day will also make someone difficult to lie either to themselves or to others because his heart is convinced that the final day or the day of vengeance will surely come. So when someone makes a mistake there must be a sense of regret in the heart. By principles of the future, a person will prefer the long term rather than the short term. The success he/she gets will be widely distributed to the people and to humanity.

Fifth: the principle of realizing the vision

The principle of realizing the vision is interpreted by faith to *qadha'* and *qadar*. This vision is an intention that is really embedded in the heart and visualized in the mind. Vision is a very important thing in human life, when he will do something. *Qadha'* and *qadar* is one of the sixth pillars of faith. *Qadar* is often understood as the “destiny“ that is absolute will of Allah and unchangeable while *qadar* is commonly understood as Allah's prerogative, and *qadar* is a human right that is sought in earnest, optimistic, and without hesitation. The principle of *qadha'* and *qadar* is the spirit of life which refers to sunnatullah and organized and arranged Allah's destiny.

The belief in *qadha'* and *qadar* will make a person live a life meticulously according to the law set by Allah, he/she will strive as much as possible to walk according to the flow of sunatullah. For him, success is something to be picked up and struggled endlessly, not awaited. Thus,

it takes uneasy effort through planning, implementation and strict supervision and that too does not guarantee a person will succeed, because it is only human effort, but only Allah who has the will and power, and by remembering Allah the heart will be calm, because the failure is Allah's destiny.

Sixth; the principle of belief in angels

One of the Pillars of Faith is believing in angels, the Qur'an and many Hadiths explaining to us about the characteristics of angels as follows: 1) Angels created from light; 2) Angels have no will and lust, as in (Q. Al-Furqon 25: 7); 3) Angels obey Allah's command without the slightest denying, as it is stated in (Q. Al-A'raf 7: 206); 4) Angels are endowed by Allah the power, as it is stated in (Q. Al-Haaqqah 69: 17); 5) Angels can turn into anything in form by Allah's permission, as embodied in (Surah Huud 11: 77).

Angels are disciplined, obedient, and loyal creatures of Allah. Angels can be interpreted as messengers or Allah's tools that obey the owner in governing the universe. Like computers that are programmed to dutifully accept instructions by its makers, Angels are also programmed to be obedient and loyal to Allah's commands. We see that electromagnetic rays are also always 'obedient' to the laws of physics that Allah has established. If this electromagnetic ray is not 'obedient', Albert Einstein will not include the value of c (the speed of light) in the formula; $E = mc^2$ as constants (constant).

Throughout this realm of nature, there is much evidence of the

Angels' obedience to God's command. For example, the task of the Angel is to rain down. The task of this Angel can be explained scientifically. According to the laws of physics, heat transfer takes in three ways: conduction, rejection and rays. Through rays, the sun can transfer heat (energy) to the water in the oceans. After obtaining energy, the water in the ocean evaporates into the air and condenses into rain.

Without rays, it is impossible that the cycle process of rain occurs because the Law of Immortality Energy states that energy can not be created and destroyed, it can only change its shape. Scientifically, water can not suddenly evaporate into the air without any energy being transferred. Therefore Allah decreed that the energy from the Sun which is a source of energy for the water on Earth could evaporate and Allah gave the task of the angel (light) to be the mediator of this energy transfer. Therefore a cycle of rain occurs.

Angels have unequal allegiance. Having no other interests and carrying out Allah's commands completely. They are very disciplined in performing their duties. As Allah says in (QS. At-Tahrim 66: 6), that *"...they (angels) do not disobey Allah in what He commands them but do what they are commanded."*

In the perspective of Islam, angels have their own duties, as the following example: 1) The angel Gabriel, called an angel of revelation, who is in charge of bringing revelations from Allah to His Messenger; 2) The angel Mikail, in charge of delivering blessing prosperity to humans and other creatures of Allah; 3) The angel Israfil, in charge of blowing the trumpet on the Day of Judgment; 4) The angel of Azrael, who is in

charge of taking the life of Allah's creatures; 5) The angel Munkar, who is in charge along the angel Nakir, asks questions in the grave (*barzah*); 6) The angel Nakir, who is in charge with the angel Munkar, asks questions in the grave (*barzah*); 7) The angel Raqib who are in charge of recording the good deeds of human beings; 8) The angel Atid in charge of noting the bad deeds of human beings; 9) the angel Malik in charge of guarding hell; 10) the angel Ridwan, who is in charge of guarding paradise.

The knowledge above may be an illustration of the integration of Islamic education with science and technology. That science and technology can actually be an empirical fact boosting the truth of Islamic teachings. Teaching that was initially more dogmatic became to be more easily understood. This integration is of course along with the hope to further improve students' understanding of the subject matter of Islamic education and at the same time as a confirmation of the belief in the truth of the Qur'an.

Islamic education efforts in facing negative impacts of science and technology

Islamic education material should be able to stimulate human nature whether spiritually, logically, and emotionally so that it can perform its role well, either as a servant of Allah SWT or as khalifah on earth. According to A. Qodry Azizy (2004: 81), three components of Islamic education as a key in controlling and restoring science and technology to its original position, which are:

Amar ma'ruf

Islamic education introduces the concept of *amar ma'ruf* development. It is not only related to social intercourse, but also this is interpreted as well as self-development and science and technology development positively. So everything that is produced by Muslims should be able to provide a positive value for his life and the circumstances around him. Even in the development of science and technology, Muslims should direct the use of science and technology to the right way, which is blessed by Allah SWT.

Nahi munkar

Islamic education leads people to be able to discern and choose the truth. If there is a misuse of science and technology, Islamic education requires Muslims to avoid it then improve and prevent the abuse.

Believe in Allah

This third point is the main point of Islamic education because by having powerful faith, Muslims will be able to face the negative impact of science and technology. Believing in Allah SWT will bring fear of disobeying Him and ashamed of doing the destruction on earth. Regardless of any kind of negative impact of science and technology, Muslims will be able to fortify themselves through continuous improvement of faith. Since the negative impact of science and technology basically will not be unstoppable, it is only us that must fortify ourselves as best as possible to deal with it.

Result of observation of creativity learning of integration of Islamic education with science and technology

The focus of observation includes three aspects: fluency, flexibility, and elaboration. This aspect is measured using an observation sheet. The observation sheet consists of 5 options that shows indicator such as excellent, good, sufficient, less, and very less.

The observation results show that for the aspect of fluency only 41.28% (n = 27) on students who have excellent category; 36.69% having good category; 22.01% who have sufficient category; 0% who have less category; and 0% have very less category. Overall students' creativity, if it is viewed from the aspect of fluency, maximally expressed the idea.

The observation results indicate that for the flexibility aspect only 36.69% (n = 27) on students who have excellent category; 44.03% who have good category; 19.26% which have sufficient category; 0% who have less categories; and 0% have very less category. Overall students' creativity, if it is viewed from the aspect of flexibility, expressed maximally the idea.

The observation results indicate that for the elaboration aspect only 33.98% (n = 27) on students who have excellent category; 42.71% who have good category; 23.30% having sufficient category; 0% who have less categories; and 0% have very less category. Overall students' creativity, when it is viewed from the aspect of elaboration, reveals the idea maximally.

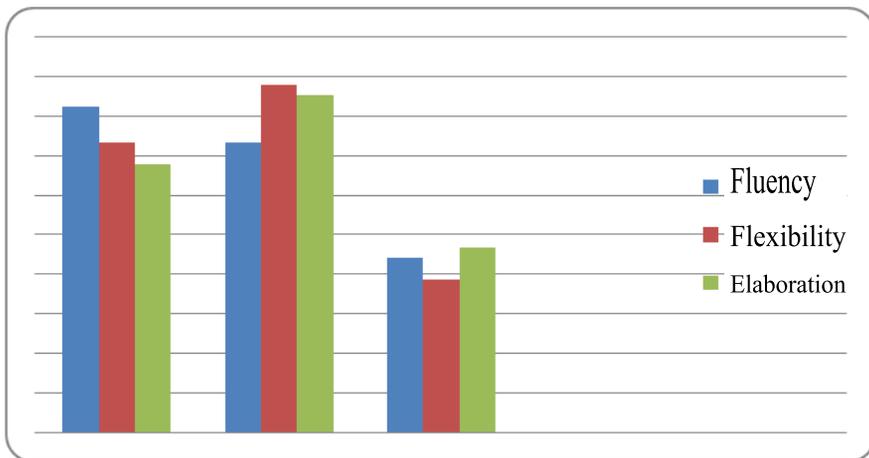
The matrix to clarify the initial conditions of creativity of

students' learning covering all three aspects which is presented by Table 1, while the histogram is presented in Figure 1 below.

Table 1. Matrix Results of Creativity Learning of Integration of Islamic Education with Science and Technology

Aspects	Assessment of Categories (%; n= 27)				
	excellent	good	Sufficient	less	Very less
Fluency	41.28	36.69	22.01	0	0
Flexibility	36.69	44.03	19.26	0	0
Elaboration	33.98	42.71	23.30	0	0

Picture 1. Histogram of Creativity Learning of Integration of Islamic Education with Science and Technology



Conclusion

By knowing and contemplating the various existence of regularities and natural phenomena, it will cause have faith, piety, and spiritual awareness in the human souls that how little human beings and how great Allah as

the creator of the universe and all its contents.

In addition, Al Quran also gives guidance to the human life in order to be a pious man who can survive and safe, it contains much scientific information. Although the Qur'an is not a book of science and technology, it contains much scientific and technological information, but it only states the very important parts of principle from the intended sciences and technology. The Qur'an also encourages Muslims to study, investigate and analyze Allah's creations.

By the integration of Islamic education with science and technology, it is hoped that the learning will be more meaningful and easily understandable. Therefore the goal of Islamic education in directing students to know, understand, contemplate, believe, be piety, and have noble character in implementing the Islamic teachings from the main source of the holy book Al-Quran and Al-Hadith, through teaching guidance, the training, and the use of experience can be accomplished. The key in controlling and restoring science and technology to its original position, namely: *amar ma'ruf, nahi munkar*, and believe in Allah.

Observation result of creativity on students shows that the fluency aspect of the students who have excellent category is 41.28%. The results showed that the aspect of flexibility of the students who have excellent category amounted to 36.69%. The observation results indicate that for the elaboration aspect of the students who have excellent category shows 33.98%.

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