International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 7, 2020
ISSN: 1475-7192

Islamic Science: Theological Doctrine of Science Learning in Islamic Universities

Tedi Priatna[1, *]
[1]Department of Islamic Education, UIN Sunan Gunung Djati Bandung, Indonesia. ORCID ID: 0000-0002-8491-5405
[*]tedi.priatna@uinsgd.ac.id

Abstract: *This paper is intended to reveal the concept of Islamic science used in science learning in Islamic universities. The method used is phenomenology type of qualitative research. The data are analyzed philosophically, historically, and pedagogically. The results of this research show that Islamic science is a theological doctrine which sourced not only from the holy Quran but also from the scientific traditions of Moslems in the middle age. It also concerns with the social, politic, and cultural characteristics of Islamic education institution, specifically Islamic universities.*

Key words: *Islamic Science, Islamic Education, Islamic University, Science Education*

I. INTRODUCTION

The main reason why God is ignored in science is the strong influence of materialism in the modern era, specifically the nineteenth century. Materialism argues that metaphysic things do not exist. In principle, anyone who denies the existence of some specific entities is an *eliminativist*. In regards to that, a productive materialist can be seen as an *eliminativist* of immaterial beings (Ramsey, 2003). According to Newton, the universe is composed of atoms which bind to each other mechanically in time and space and are eternal. As a result, the space, time, and material also become eternal (Lederman & Teresi, 2006; Westfall & Klein, 1972).

The changes in the universe are basically separations, integrations, and movements occurring in physical laws. It implies that scientists are only the audience outside the scientific system. In arranging their scientific arguments, nineteenth-century scientists set aside their beliefs, desires, and emotions as human beings. Natural phenomena can be understood without any intervention from the scientists' minds, desires, and emotions. They are nothing compared to the spacious, vicious, and infinite universe (Heisenberg, 1958).

The nineteenth-century scientists confirm that the primary thing is material, while the mind is secondary. The beginning and the end are materials (Gallagher & Zahavi, 2013). There was no higher, nobler, and later in the nineteenth-century science. Everything starts and ends in science. They were trapped in scientism, which believes that any supernatural causes or power of Allah are not important. His existence is not necessary because materials are eternal. Scientism consistently changes into atheism. Scientific works attack God and religions in order to defend the existence of science. Freud says that when humans still need religions, they will always be children who need their Father. Father is the protector of humans from the ferocity of nature. This kind of humans constantly runs away from the reality. Karl Marx concludes that religion must be abandoned for it can become opium for the people (Hansen, 1980; Meikle, 1985). Nietzsche prays for God to rest in peace or die (Frey-Rohn, 1988). Those arguments show that in the nineteenth-century science, there is no God who absolutely creates and keeps the universe. The hydrogen, even, produces itself spontaneously in the universe, without any intervention from God. Although technology nowadays is in pursuit of utility, power, and profit, it seems that the people's standard or rationality is also driven by distant dreams, spiritual longing for supernatural redemption (Noble, 2013).

Criticisms on materialism, scientism, and atheism of the nineteenth century have started to be given by the twentieth-century scientists. Einstein proves that the time and space are not absolute, but relative. They depend on the scientists' understanding, minds, and physical organs. Aristotle, Galileo, Newton, and even Einstein have tried to define time and space, but none comes up

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

with a final definition (Ye, 2011). The laws of motion depend on the observers. The characteristics of the minute particles of a material cannot be separated from the scientists' choices, wills, and actions. James Watson finds that DNA is exquisite (Watson, 2004). The beauty can be the basis of a scientific truth; that is simplicity, harmony, and clarity. The twentieth-century scientists believe that the universe is a single totality which develops harmonically. The core of the sun constantly produces hydrogen which in turn becomes helium. The universe is then alive and has a beginning. When there is a beginning, there must be an end. Therefore, the universe is not eternal. The Eternal Deity is not material but immaterial, which is an ingenious, everlasting, and eternal idea; that is God, the creator of everything (Proctor, 2005).

Perennial philosophers also deny the materialism, scientism, and atheism which existed in the nineteenth century. Aldous Huxley states that science cannot exist by itself. The universe cannot exist without the presence of God (Huxley, 1947). In addition, the reality of universe can only be reached by the scientists' minds, wills, and emotions through traditions, rites, and symbols coming from God (McDonald, 2003). Owen C. Thomas deduces that the universe comes from God, the Creator and Keeper of the universe and everything in it (Nagel, 2012).

Pope John Paul II, the head of the Catholic Church in the end of the twentieth century criticized the nineteenth-century scientists by saying that religion can purify science from false worships and absolutisms. The scientists must realize that the universe depends on Allah. Allah is omnipotent, free, and characterized by Its own purposes and wills. The Pope has offered a typical method to the scientists that it is faith that seeks for understanding. Religion has a significant point of reference which is sacred (Pargament et al., 2005).

This paper is aimed at: 1) emphasizing the critical discourse on the nineteenth-century scientism. In some points, the criticism is similar to that of the scientists', perennial philosophers', and theologians of the twentieth century, which is to bring back the questions on God in sciences. However, in some other points, the criticism is different from theirs. In this writing, the critics on the nineteenth-century science use the history and the scientific traditions of the Moslems in the middle age as the references. Besides, the western theologians surely use their holy bible as the reference to identify the divine values. Meanwhile, this paper uses the holy Quran as the basis of revealing the divine values, so that the idea of Islamic science comes up; 2) making the idea of Islamic science as the inspiration of theological doctrine in the study of sciences in the Islamic education institutions of the twenty-first century. In Indonesia, Islamic education institutions specifically Islamic universities have specific social, political and cultural backgrounds. In addition, there are transformation and modernization occurring which promote modern education institutions which focus not only on the study of Islam but also modern sciences (Subhan, 2012). Therefore, the discussion of the idea of Islamic science in the study of science in Islamic universities is important to be conducted.

II. RESEARCH METHOD

The research employs qualitative approach which is used to interpret the data analysis results deeply and comprehensively to discover appropriate recommendations which fulfill the requirements of the research (Merriam, 2009) (Maxwell, 2008). Phenomenological type of qualitative approach is used in this research. The phenomena being revealed are historical events, philosophical ideas, theological doctrines, and pedagogical facts (Yin, 2011) (Tavallaei, M and Abu Talib, M., 2010). The subjects of this research are human ideas or thoughts revealed in the primary or secondary manuscripts. The phenomena, which have become the data of this research, are analyzed using the philosophical, historical, and pedagogical point of views. Naturally, the analyzed data or phenomena will lead to *eidos* or the core phenomena which are experienced and believed by the Moslems, either in a specific geographical area or in the world. That in the discussion some similarities with other religious point of views are found is where the *intersubjectivity* lies. It is that the assumptions could be shared with other people (Buckley & Irawan, 2015). The data collecting technique used is the library research method. The data are then analyzed in the following steps: (a) describing, (b) discussing, (c) enriching and criticizing, and then (d) conducting an analytical study on the main ideas through the analysis of relationship, comparison, and development of a rational model (Maxwell, J, and Miller, B., 2008) (Suriasumantri, 2001).

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

III. FINDINGS AND DISCUSSION

Findings

Until the end of the twentieth century, historians of science rarely referred to the repertoire of Islamic sciences. Thomas Samuel Kuhn, a historian of science who is well-known for his work *The Structure of Scientific Revolutions*, did not make the slightest reference to the history of Islamic science. His belief that everything starts from science becomes incomplete since he did not tell anything about one of the world's scientific heritages, the Islamic science of the Middle Age (Kuhn, 2012). The development of science which goes not accumulatively but revolutionarily might be broken or even get more convincing when faced with another scientific paradigm, which is the Islamic science. The radical ideas are merely unilateral reflections and are incomplete for it only read the Aristotelian mechanics as the only mechanics influencing Galilei and Newton who were well-known in the seventeenth century. In fact, in the ninth century Moslem scientists had developed another version of mechanics theory. Banu Musa in his book *Kitab al-Hiyal* (Mechanical Equipment) provided an in-depth discussion of Archimedes Mechanism which Kuhn rarely referred. Al-Khazini created essays on mechanics in *Kitab Mizan al-Hikma* (the Balance of Wisdom). It contains not only the theories of gravity on solid objects but also on liquid for worship purposes. Badi' al-Zaman al-Jazari, a twentieth-century engineer, developed mechanics to collect and move water as well as making it a source of electrical energy without batteries. It worked using the principle of the standard times of call to prayers (*adzan*), which is mechanical on one side but dynamic on the other side in accordance with the earth's revolution around the sun (Saliba, 2007).

Sir William Cecil Dampier in his book *A History of Science and Its Relation with Philosophy and Religion* inserted the history of Arabian science. He quoted Averroes who introduced the new concept of the relation of religion with philosophy and science. According to Averroes, religion is not a branch of science which can be reduced into propositions. Instead, it is a person's inner strength which is different from the generalization of demonstrative and experimental sciences. Meanwhile, theology is the source of harm for both, which causes wrong assumptions and spark hostility between religion and philosophy on one hand, and destroy religion with pseudo-science on the other hand (Dampier, 1961).

One of the twentieth-century Moslem scholars who wrote about Islamic science is Sayyed Hossein Nasr. One of his theses shows that the whole reality of the universe leads to an Ultimate Reality who is the Sacred. The theological doctrines in the science claim that human beings are always connected to a cosmic being. The humans who always remind this relation are the prophets and apostles as the messengers of God. In the perspective of perennial philosophy, several prophets such as Daud (David), Sulaiman (Solomon), and Muhammad PBUH were in fact scientists (Nasr, 2007).

Until the beginning of the twentieth century, the repertoires and heritages of Islamic science were rarely used as references because of the small number of Islamic science scholars who seriously worked on the history of Islamic science of the Middle Age. References on the history of Islamic science are mostly written by western scholars such as George Saliba, Sir William Cecil Dampier, Charles Van Doren, and Howard R. Turner. It was the American museum of national history, the Smithsonian Institution, which financed Turner's researches on the history of Islamic science of the Middle Age. Nasr's research funding on Islamic science was also more supported by American and European countries than the Islamic countries.

The small number of references of Islamic science history causes the Islamic education dominate by religious study and less science. Meanwhile, the curriculum of *madrasah* and academy in Jundishapur, Persia, and Egypt in the eighth century included more science than religious contents. At that time, the students learned about their religion not at schools but at home. Stanwood Cobb states that the first university in the world was established by the Moslems in the ninth century in Bagdad, and then Cairo, Fez, and Cordova. Most of the universities already owned their hospitals. It shows that Islamic universities at that time were not identical with religious studies by with sciences, one of which was medical science.

Science learning in Islamic education institutions in the Middle Age did not focus only on sensory-motoric objects but also the spiritual ones. For the Moslem scientists and Islamic science teachers in that era, metaphysic aspects were closely related to the intellectuals who helped in revealing the apparition of God. The universe contains God's spirit in the form of balance, beauty, and kindness. Ibn al-'Arabi argues that the universe is a mirror reflecting divine lights. The clear water in the river is a signpost

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

to Allah's grace. Historical facts show that most teachers in that era were mostly scientists, and not only religious priests. Meanwhile, there is an interesting fact to look at, which is the role of religious leaders in generating scientific products in that era. the increasing power of the political elites caused a decrease in the scientific products (Chaney, 2016).

Sharia and law in Islamic education in the Middle Age did not learn only *fiqh* (Islamic jurisprudence) but also researches on God's law that applies to the universe, which is cause-and-effect. There is a harmony ad dynamics in the *ilahiyyah* (divine) causality law. The relations among different creatures such as animals, plants, minerals, and bacteria are tied subtly in the divine spirit. God has an unmatched measurement in creating and arranging everything. God is also a Composer who presents a harmonic and fair music show to all the creatures, for them to remember the Creator. Humans have gained a great power in science and technology but often misuse it for destructive purposes (Haidar Putra Daulay, 2014). It becomes our food for thought that science must be accompanied by other studies to make it constructive.

Science learning in the Islamic education institutions in the Middle Age neither was dichotomous nor put distance between religious study and natural science. The motivation and the main characteristics of the holistic educational program balance the Islamic and western traditions, in which some phenomena are explained by the transmission of values and methods of both religion and science cumulatively since the classical era until now (Douglass & Shaikh, 2004). Natural sciences are not seen as visible objects which are separated and distant from the divine spirit. All materials in the universe have connected feeling with God's attributes. Everything in the material nature is the apparition of God's attributes and it is relative-universal unless being given a decree by Allah which makes it absolute. According to Jabbir Ibn Hayyan, absolutism is depicted in the permanence of objects which are connected with God's will and the human mind. If they have faith in Allah, the nature will work in Allah's normal law and even brings blessings ad grace. On the other hand, if they have no faith in Allah, the nature might be damaged and disasters might happen, harming the humankind. In other words, the nature will still work in its own logic before God instructs it to change into supra-logic. Therefore, the universe always has mysterious things to make humans remember God. This is how science was taught in Islamic education institutions in the Middle Age, by always getting close to the theological doctrines. It is what we call Islamic science learning.

Discussion

The birth of State Islamic Universities/*Universitas Islam Negeri* (UIN) which was originally State Islamic Schools and State Islamic Institutes towards the end of the twentieth century in Indonesia indicates that Islamic higher education institutions in the twenty-first century do not focus only on religious studies but also on general sciences. UINs have opened science and technology faculty, psychology faculty, and some even have medical faculty. The birth of UINs in Indonesia is a hope for humankind. UIN is a model of Islamic university which rests on the heritage of Islamic civilization history that has proven itself to be a mercy for mankind and all others. UINs are Islamic universities in the twentieth century which developed knowledge in an integrated way, without dichotomizing between religious studies and sciences.

UIN Sunan Gunung Djati Bandung is an example of Islamic university in the twentieth century which bases its philosophy on knowledge integration paradigm with the principle of "*wahyu memandu ilmu*" or "revelation guides knowledge" as the sub paradigm. UIN SGD Bandung is a model of Islamic university in the twentieth century which establishes science based on faith and righteous deeds (Praja, 2005). Through faith, knowledge, and righteous deeds, the birth of the Islamic science paradigm is driven by the desire to perfect the worship to Allah.

Astronomy, the very first science which was systematically born in the world of Islam, was conducted to perform worship to Allah. The determinations of prayer time and when Ramadan comes which follow the moon and the earth revolutions around the sun are aimed at giving scientific bases of worship to Allah. By the Moslem scholars in the Middle Age, Astronomy was called *'ilmu al miqat* or the science of time maker. When making the astrolabe of time changer, Muhammad bin Ahmad al-Battuti wrote, "Praise be to Allah. The maker of this astrolabe is Allah's servant, Muhammad bin Ahmad al-Battuti" (Turner, 2019). This way, in the Moslem scholars' perspectives, astronomy is not a separated science from the elements of divinity, but is a science integrated to the values of faith.

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

In the Islamic science, science is subjective. Its existence depends on humans. The explanation of the universe, as is other human deeds such as sitting down, standing up, eating, traveling which are formulated in accordance with the humans' will as the scientists. Meanwhile, *tawhid* is an objective science. The essence of Allah as the subject of the objective science exists by itself, not depending on others. Therefore, no one could formulate precisely the Supernatural thing, except by surrendering as objectively as possible to The Supernatural itself. If humans assume that they know about The Supernatural, the truth is they know nothing but a little and only when The Supernatural allows them to (Ahmad, 2004). Islamic science put the holy Quran as the guidance in formulating religious studies and sciences to make them right and blessed by Allah (Zaelani, 2015).

In addition, the holy Quran inspires, guide, and drive the people to develop religious study and science rationally and empirically or *al-tajribat al hissiyah*. *Al-tajribat al hissiyah* is conducted by using two ways: *al-hadasiyat* and *al-mujarabat*. *Al hadasiyat* is being empiric rational as well as surrendering to The Supernatural (ontological). Many things in the universe happen illogically and beyond humans' prediction such as eclipse, earthquake, hurricane, and other terrible events. It means that scientists must surrender themselves to Allah and always pray for Allah's help for them to have faith. In the meantime, *al-mujarabat* means the experiences that could be formulated by humans through experiments and observations (Ibn Taymiyah & Khaili Harras, 1989). Islamic science puts *al-hadasiyat* and *al-mujarabat* fairly in accordance with the vision of *al-shirat al-mustaqim*, the straight and right path favored by Allah. The straight and right path is taken and shown by the godly people, the prophets, and the apostles of Allah. They are called *qisth* because they are just in managing the faith (ontology), science (epistemology), and good deeds (axiology) to come together consistently. Islamic science is in the mission of the caliphate; that is to prosper the universe as a form of worship to Allah (axiological).

In the perspective of Islamic science, the inductive science is framed by the deductive *Tawhid*. Science roots from *kauniyyah verses* (scientific facts) or the universe and *qauliyyah verses* or the holy Quran (epistemological) (Bucaille, 1978). Both are verses of Allah (ontologic). So, science and religion must both be guided by the revelation closely monitored by Allah the Omniscient. In other words, praying for guidance and help from Allah is the characteristic of scientists who apply the Islamic scientific doctrines.

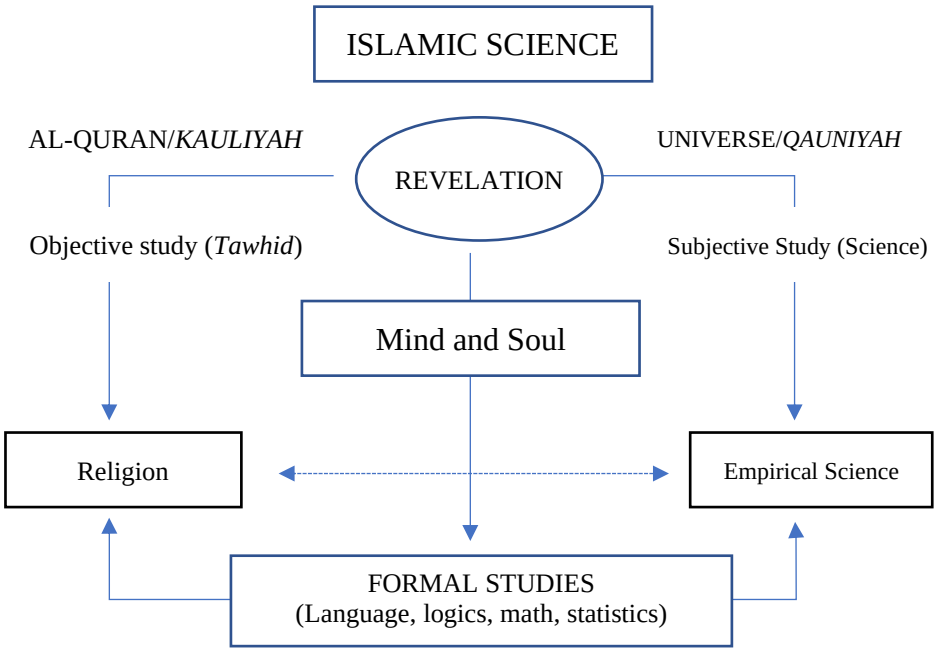

Figure 1 Scheme of Revelation in Islamic Science

UINs as the Islamic higher education institutions have an important role in managing the Islamic science education in the higher education level. One of the roles is to formulate the Islamic scientific doctrines containing faith (ontological), knowledge (epistemological), and good deeds (axiological) as the purposes, values, and ideology of science education in Islamic universities.

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

The purposes, values, and ideology (Ernest et al., 1991) force UINs' professors, lecturers, administrative staff and students to obey and implement them. Ideology is a group of ideas and beliefs which competes each other to be present in social, cultural, and political contexts (Mansour, 2010). The *civitas academica* of UIN specifically the lecturers and students are parts of the people of Indonesia and of the world. There is a complex link between the lecturers' view on science and religion and the global community of the twenty-first century. *Wahyu memandu ilmu* becomes a new spirit for the Moslems to revive their enthusiasm of knowledge to love Islamic science, especially the natural sciences which have been lost in time for almost seven centuries (Irawan, n.d.).

The people of the twenty-first century are collaborative community. Different lifestyles, cultures, and religious beliefs demand collaborations so they could respect each other. Becoming a global citizen complements the skills of collaboration and communication, as it allows students to effectively learn from and work collaboratively with a host of different individuals from diverse cultures, religions and lifestyles. This encourages a classroom and work environment of open mindedness and mutual respect for one another (Gorby, 2015).

The lifestyles, cultures, and religious beliefs of UIN's lecturers tend to be existential and secular as how it went in the twentieth century. They were mostly born before the year 2000. Consequently, they need to connect with the lifestyles of the students who were born in the twenty-first century which are open, collaborative, communicative, and nominated by some specific religious trends. The twentieth century was probably the high point of secularization, while the twenty-first century will likely be dominated by religion (Gorby, 2015). UIN students, by utilizing the development of digital media and information technology, always desire to be parts of the global citizens who tend more to be religious than secular (Jones, 2013). It means that the Islamic science learning is founded on the scientific perspectives (Ernest et al., 1991) embraced and applied by the lecturers in the students' Islamic-religious point of view in the social and cultural contexts of the university (Mansour, 2010). The connectedness forms an environment and model of Islamic science learning in the university.

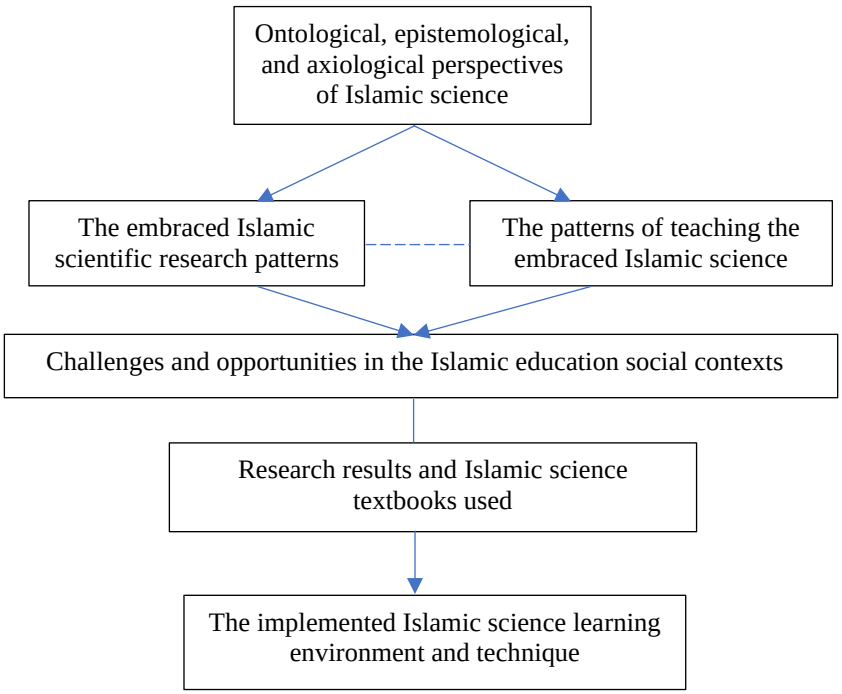

Figure 2 The relation of embraced scientific understandings with the Islamic education social context forms an Islamic science learning technique

Received: 10 Nov 2018 | Revised: 20 Dec 2018 | Accepted: 02 Jan 2019

The Islamic science learning environment has been established by UIN Sunan Gunung Djati Bandung since 2006, a year after its status changed from institute into university. In the daily learning activities, lecturers and students perform the *dhikr* to reinforce their faith in Allah. They chant many *thayyibah* words, *tasbih, takbir, tahmid, and shalawat* before the learning process. UIN Sunan Gunung Djati Bandung builds praying facilities such as *masjid* (mosque) and the house of Quran to perform prayers and recite the holy Quran. In addition, the university has also built integrated laboratory for practicum activities and to develop Islamic scientific researches of the Middle Age beside the nineteenth and the twentieth century western science. UIN Sunan Gunung Djati Bandung also still has the Islamic Philosophy subject as a room for students to practice their critical thinking and problem-solving skills. At last, the university also keeps the tradition of community service apart from the other subjects to implement the principles of doing righteous deeds.

IV. CONCLUSION

Islamic science is a theological doctrine inserted in the science learning in Islamic universities. The Islamic science roots not only from the holy Quran but also from the scientific tradition of the Moslems in the Middle Age and considering the social, political, and cultural characteristics of the twenty-first century students who are religious, collaborative, and open to global communities. UIN Sunan Gunung Djati Bandung as an Islamic higher education institution of the twenty-first century, when implementing the Islamic science learning, has the potentials to revive the Islamic scientific traditions; that is to develop the Islamic science in accordance with the needs of the twenty-first century society.

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