

Contribution of Islamic Thought toward Modern Sciences Advances

Mas'an Hamid

Prof. At Faculty of Arts and Humanities, State Islamic University of Sunan Ampel Surabaya

Abstract: *The contributions of Islamic thought to the Advancement of Science in Europe, Asia, Africa and America is a historical fact and is recognized by many Western scientists. Various Islamic scientists such as Ibnu Sina (Medical), Al-Khawarizmi (Mathematics), Jabir Ibn Hayyan (Chemistry), al-Fazari (Astronomy), and Ibnu Haisyam (Optical) are the Islamic scientists who contribute much in the sciences that are now developed by the West. The author uses two indicators becoming the focus of discussion as a benchmark of the success of the contribution of Islamic thought to the progress of science. First, there is a translation movement to the general book of knowledge from the Arabic language of the Latin language; secondly, there is the recognition of Western scientists about the contribution of Muslim thought in the process of scientific progress in the West. This research found that many kinds of Islamic literature or scientific works by Islamic scholars such as mathematic, chemistry, medicine, astronomy, optics etc have been translated to your adopted as the western studies. Second, many western scientists admit to the existence of scientific transfer from East (Arab) to the west (Latin).*

Keywords: Islamic scientists, Arabic literature, Islamic development, contribution, western civilization

1. Introduction

The development and spread of Islam cause consequences and generate realities. What the authors want to convey is the development of Muslims that gave rise to a certain reality in the late VIII century to XVIII AD. The reality is marked by the progress of civilization in Europe, Asia, Africa, and even to America. Especially advances in science, both general and religious knowledge. However, as a general description, it should be mentioned about the situation of Europeans, Africans, Asians and Americans at the time before and after the arrival of Islam, as well as the causes of the progress and decline of the Islamic world.

2. The State of Europe, Africa, and Asia Before Islam

Towards the birth of Islam, the governments of the countries in Europe were ruled and controlled by corrupt, unjust, lawless, and luxurious kings and clerics, and even splurge on the suffering of the people. At that time it was thriving academies and colleges like mushrooms in the rainy season, which scored and gave birth to scholars, scientists, technocrats, and scholars. But, their existence is not desired by the rulers.

For the sake of power, the rulers of kings and religious leaders have gone through a breakthrough by carrying out decrees and very cruel and inhuman. All the professors, scholars, technocrats, and intellectuals are massacred. All of their colleges and colleges were burnt down. All the scientific books and libraries were burned, and since then the European community was forbidden to read and write.

The incident by Prof. Dr. Hull in his History and Philosophy of Science (1959) as cited in (Syakur, 1989) is termed "The battle between religion and science". This time religion won, while science suffered defeat. As a result, the Europe continent experienced the dark ages. Religious leaders who should be role models to nurture the people, guide the right path, protect and support the weak, become the source of

kufur, polytheism, hypocrisy, misery, and suffering. Even gather with kings they blackmail and oppress the people.

The suffering grew heavier and miserable after the war between Jews and Christians broke out. When Persia can conquer the Middle East, Jews kill the Christians. On the contrary, when the Roman under the leadership of Heraclius defeated the Persians, the Christians brutally murdered the Jews. (Syakur, 1: 1989).

Almost all of the East Roman rulers did wrong, extorted taxes, and rebelled against the people. They live in the suffering and misery of the people. Suffering is severed after the emergence of disputes and disagreements between religious communities. So, they stuck in the life of rumpus and various kinds of entertainment. They have built a big stadium for a fight show between two sharp-armed guys. Even the battle is frequent between humans and beasts. If the show succeeds with the victory on the part of the beast, and human beings suffer defeat with a very heartbreaking death, it is greeted by the audience with cheers of joy, jumping overlapping, which sometimes engulfs thousands of dead victims trampled.

The cruelty of the East Roman rulers towards the Egyptians and Syrians was more severe and sadistic. The proceeds of wealth in the both countries were drained, brought to Rome, and the people were blackmailed to death, unable to eat or dress. While the rulers and the Romans lived full of luxury, even spree in the middle of people who are suffering miserably. Many of the Egyptians sold themselves and children to survive and live their lives.

In the VI century AD (Sasanid government) has been born some flow or life's view, so the state of the people more miserable. Some are apt to Apocrypha (simple life), some tend to Chauvinism (emphasis on type, level, and religion), even lean toward communism with the way life of proletarianism that causes chaos, destruction, and murder everywhere.

3. The State of Europe, Africa, Asia, and America After the advent of Islam

Islam comes and develops peacefully and quickly in the midst of the world community (Europe, Asia, Africa, America, and other countries), which is being overwhelmed by darkness, decline, stupidity, and suffering. As explained by Kail C. Elis (1988: 272).

Islam spans a vast geographical area, extending from Africa, the middle east, and southeast Asia. The most populous Muslim countries (Indonesia, Pakistan, and Bangladesh) are either Arab or middle eastern, and large Moslem populations live in India, the Soviet Union, and China. As a result, if immigration and conversions, Islam is also a growing religion in Europe and United States.

According to Jhon as quoted in (C. Elis, 1988: 249) stated that within one hundred years of the Prophet Muhammad's death, the original Islamic community, through peaceful expansion and conquest, becomes an empire more extensive than any the world had known. In time the Islamic world extended from Arabia west to North Africa and Spain, and east to Indonesia. In addition to developing the political, social, and legal institution, Islam gave birth to a great civilization. Muslim contributed to philosophy, mathematics, geometry, optics, physical science, and the arts. While western Christendom passed through its dark ages, Islamic civilization flourished; The Muslim world was the locus for the major center of learning and culture.

Sayyid Qutb explains that the development of Islamic da'wah is running so rapidly that the Islamic Ummah is strong and victorious, due to three factors; *First*, the Qur'an is the only source of life guidance for Muslims and the basic place to think and act. *Second*, Muslims read Al-Quran to seek and carry out the command of God concerning the matter of life, and they are also diligently digging up the content of Al-Quran with reason and in a device of knowledge so that gave birth to discoveries in various sciences. *Third*, a person when he embraced Islam, he abandoned the customs of his ancestral jahiliya, he lived in another Islamic atmosphere entirely with his past and carry out Islamic life pre-life well, true and perfect in order to achieve Allah's blessings. (Qutb, 25-27).

4. Europeans learn from the Islamic world

After knowledge gained victory and glory, religion suffered defeat and humiliation. As a result, European societies can not accept the doctrine of the two religions (catholic-protestant) trinity, resulting in the flow of secularism and communism, so the people of Europe no longer believe in religion, Bible and God, even they say *religion is the opium, God is dead, Bible is human*.

On the other hand, the development of Islam in Europe was also encouraged by the crusade, which caused Islam in Europe hostile and vilified for centuries. But after the crisis-stricken European confidence, it is the only faithful friend of Islam to be together to face the secular and communist.

Islamic literature and international scholars entry into Europe, many empty churches are given by the local government to be a mosque, even in Nijmegen, Dutch, a priest named Prof Peter became chairman of the founding committee of the mosque. As a result, Islam is growing rapidly and rapidly, and Europe will be a fertile field for the future of Islam.

5. Islam in Africa and Asia

Judaism, Christianity, and Islam have the same great potential and role in the world's arena, therefore their existence has been exploited by world figures to be transferred to other countries. Constantine succeeded in making Roman as a center of religion instead of Jerusalem, while Tojo failed to make the city of Tokyo as the center of Islamic religion instead of Mecca.

As matter of fact, Western Christian world sleeps when the Islamic world wakes up and triumphs, the Islamic ummah awakens the sleeping Christians, but after they wake up the Islamic ummah is sleeping better than they are. Christians receive the relay of knowledge, but without faith, the Muslims are still believers, not knowledgeable. Because their science is advanced and modern, Like the Islamic ummah first. As the result, the western world is getting rich and mighty, while the eastern world is getting backward and poorer. They colonized Africa, Asia, and Latin America and while spreading the Christian religion, because of this religion as an imperialist tool.

It was dealing with what Sekotore and Jommo (1989, 6) states as below;

"When the Ehitman came we had our land and our religion. He asked us to close our eyes for prayer, at the end of the prayer we opened our eyes only to find that he had our land in one hand and a gun in the other, while we had the Bible (now)".

6. Development of Islam in the USA

Twenty-five years ago, a mosque was something exotic, something that most people had seen only in books. Today almost every major American city has its mosque or an Islamic center. (Ellias D, 1988: 245). Furthermore, Lawrence B (1988: 242) states that one of the best-kept secrets in the United States has been the rising number of practicing Muslims. Islam is now the fastest-growing religious group in the country, and over a thousand, mosques and Islamic centers serve its believers.

In addition Prof Dr. Muzammil H Siddiqi, director of the Islamic Society of Oranges, California explained about the future of Islam in America, "I am very optimistic about the future of Islam in this country (USA). Islam is here to stay. It has already taken root in this soil. It will flourish and its tree will bear fruit that will bring joy and satisfaction to all Americans". (Muzammil, 1998: 255).

As matter of fact, the majority of USA are European immigrants caused by religious conflicts over the centuries, resulting in misery and suffering, and for the sake of seeking salvation and peace, they migrate and settle in

America. Realizing this, the American people have agreed to try to make America not fared just like the old Europe that had ever become a place of religious conflict as a source of calamity and misery. If Islam is in Europe as a friend to face the crisis of confidence, secularism, and communism, then the American Islam becomes a friend for American stability.

Islam is the religion of God, the source of truth, the source of science, the source of law is now widely written and studied by various scientists, such as scientists from the orientalist as mentioned in New Catholic World magazine. So that Islam began to be known and studied, even chosen to be a religion by the American community. Hence, Islam is growing rapidly, becoming even the fastest-growing religion in America.

From the above discussion, the writer takes the study on the contribution of Islamic thought to the advancement of science which is classified into two scope research problems; there are;

- 1) Translation movement to the general book of knowledge from the Arabic language of the Latin language
- 2) The recognition of Western scholars about the contribution of Muslim thought in the process of scientific progress in the West.

7. Research Methods

This research is a type of qualitative research using the approach of historical theory in general and the theory of Islamic history in particular. This research begins with the collection of literature materials relevant to research in the form of historical material of the progress of the Islamic world and the history of the advance of European knowledge.

8. Discussion

Contribution of Islamic thought to the progress of science

As mentioned above about the contribution of Islamic thought to the progress of the nation of Europe, Asia, Africa, and America. This section will provide more detail about the process of contributing Islamic thought to the progress of science globally. The author uses two indicators that become the focus of discussion as a benchmark of the success of the contribution of Islamic thought to the progress of science. First, translation movement to the book of general knowledge of the Arabic language into Latin, second, the existence of western scientists recognition of the contribution of Muslim thought in the process of scientific progress in the western.

A. Translation movement to the general book of knowledge from the Arabic language into the Latin language

In the XIII century, some of the Christian scholars knew that the answer to the question of the position of God, universe, spirit, and others are contained in Arabic writings. For this reason, Arabic texts are deemed necessary to be translated into Western languages, including the interpretation of Aristoteles' essay, by Al-Farabi, IbnSina, and IbnRushd.

Abu Nasr Muhammad Al-Farabi (872-950 AD) besides translating Aristoteles' articles, also gave his interpretation of ethics and souls. As a great philosopher, he has written a number of original essays on psychology, metaphysics, and the theory of Eastern music. While the works of Al-Farabi, Ibn Sina and IbnRushd on music theory has been translated into Latin and became a textbook in Western Europe. Al-Farabi also authored the *Ishaul- 'Ulum* book on science, as well as has been translated into Latin and very influential in the Western world.

IbnSina (940 - 1037 AD) famous in the Western world by the name of Avicenna is a Muslim poet whose writing is interesting and fascinating. His first masterpiece of al-Majmu 'contains various branches of general science, such as Philosophy, Physics, Mathematics, and Psychology. The number of articles by IbnSina according to Colliers' and Chambers' Encyclopaedia is more than 100 pieces, among them the most important of *al-Qanun's* books on medicine, and *al-Syffa'* on philosophy. The book of *al-Qanun* consists of five volumes containing thousands of words. This book is an Encyclopedia of medical science that ruled the world of medicine in Europe for five centuries, much longer than the Galilean Greek medical experts.

If al-Makmun Hunain bin Ishaq authorized by the chief of Baitul-Hikmah as responsible for translating Greek books of science and philosophy and Persian into Arabic, then Archbishop Raymond appointed Dominico Condisalvi as the leader of the translator toward Arabic books into Latin. The archbishop's vocation of translations of Toledo's philosophical and science books has attracted many scholars throughout Europe, such as:

- 1) Robert Chaster (English) translated Jabir's essay on chemistry and al-Khawarizmi's essay on algebra into Latin
- 2) Herman and Dalmatia with an Arab also translated the Qur'an into Latin, to be handed over to Peer, the abbot of Aluni (East France).
- 3) Michael (Scotland) translated IbnSina's essay on zoology, Al-Bitruji's essay on Astronomy, and some of Aristotle's writings that have been dated: translate into Arabic. All the articles are translated into Latin.

In the field of literature, the West also gained a lot of knowledge from the Arabic works. The 1001 storybook exerts a powerful influence on Western literature. This book has inspired Westerners to fabricate stories such as Reselsby Samuel Johnson. Similarly, IbnTufail's work in *Haiy bin Yaqzan* has inspired the story of *Robinson crose*. (Basalamah, 14: 1988)

The books are translated from Arabic to Latin is the books of Medicine, Mathematics, Physics, Optica, Astronomy, and others.

1. Medical Science:

In medical science, the progress that Muslim intellectuals have is not a few. The attention to this field arose when the Caliph al-Mansur requested assistance to Jirjis bin Bukht'sy', a famous doctor in Yundisabur. Because the treatment was

successful, the medical book center was moved and translated into Arabic, initially by IbnMuqaffa', then by Hunayn bin Ishaq and another translator under his leadership.

The first famous physician was All HinSahal bin RabanAl-Tabari, who in 850 AD authored the book *Firdaus al-Hikmah*. The Arabic book is the oldest in medical science. This book according to SayidHossein Nasr contains 360 chapters, which provide a summary of the various branches of medical science, particularly on Pathology, Pharmacology and dietary.

The world's greatest Muslim physician was Abu Bakr Muhammad Zakaria Al-Razi (865-925 AD) known by the Europeans as Rhaze (hospital head in Bagdad). His essay is more 100 books, one of them is titled *Kitabut-Tibbj al-Mansuri*, composed of 10 volumes and translated into Latin in the XV century with the title *Liber al-Majisoris*. While, his illustrious essay is the book of *al-Hawi*, a medical encyclopedia of twenty-five volumes. The book was translated by Faraj and Salim (Jewish physician) into Latin by the titled Continent. The encyclopedia was printed many times and in 1452 AD the fifth edition appeared in Vinisia. This book is widely used in Europe with the encyclopedia of IbnSina titled *al-Qanun Fit-Tibbi* between the XII century and the XVII century. When Rhazes and Avicenna were more appreciated than Hippocrates and Galinos, there is Al-Razi which also wrote a book on measles With the title *al-JudriWal-Hisbah*. This book is taught not only in Latin but also other European languages, including English, and printed up to forty times, during 1498-1868 AD.

Furthermore, al-Tafsir Liman 'Ajaza' *Anit-Ta'alf* written by al-Zahrawi (Latin, Albucasis) was also translated into Latin up to five times and made reference book by surgeons for five centuries. The book is the first book in surgical history, and its contents describe some images of tools for surgery. (Thaha, 49: 1983)

2. Mathematics

In mathematics, arithmetic and number coming to the Arab world came from India through the Al-Fazari's translation. The famous figure in mathematics is Muhammad Ibn Musa Al-Khawarizmi (780-850 AD). He was the first to write a book on Arithmetic and Aljabar. It was translated into Latin by Gerard and Kremona for using as the main handbook on universities in Europe until the 15 century. The term al-Gorism or al-Gorithm in mathematics is believed to derive from the name Al-Khawarizmi. According to Risler that Al-Khawarizmi wrote a book in 825 AD which was translated into Latin under the title *Algoritmi De Numero Indorum*. (Nasution, 59: 1980).

From Al-Khawarizmi the Europeans studied Arabic numerals, the science of Aljabar and the tables of astronomy which were at the time most defensible, then translated into Spanish by the Englishman Adelard of the bath. (Basalamah, 13: 1988).

Another famous figure in mathematics is alMahani who developed Algebra, Abu Sahal Al-Quhi who authored

additional books on Archimedes, Umar al-Khayyam and Nasir al-Din al-Tusi which famous in astronomy. In those days astronomy and mathematics were in one branch. The separation between the two happened later. Among philosophers of Islamic philosophy, some have names in the field of mathematics, such as Al-Kindi who wrote several essays in this field and IbnSina who made the mathematical theory of music.

3. Chemistry

In classical Islamic civilization, chemistry seems to have a close relationship with medical science. Discussions on this subject are often found in writings on medical science. According to Risler and the chemists, Islam encounters or finds also about the various medicines used in medical bids.

The father of chemistry in Islam is Jabir IbnHayyan (721-815 AD) known in Europe as Geber. Among his essays in chemistry is the *Al-Tajmion* concentration and the *Al-Zi'baq Al Syarqion* mercury.

Chemistry at that time was based on the Greek theory which said all metal is essentially one, and gold is a pure metal. This theory encourages the emergence of experiments to find the purest metal as done by Jabir, He discovered how to manufacture various chemicals, such as *Cinnabar* and *Arsenius Okside*. Furthermore, he knew about how to obtain Alum, Alkali, Belching, Ammonia, and others in pure form.

In addition to Jabir, there is Al-Razi who also a famous chemist, before becoming a doctor he held many discussions in chemistry. Other name names that are involved in the chemical field are; Al-Tugra'i who lived in the XII AD and Abu Al-Qasim Al-Iraqi in the XIII AD. (Basalamah, 62: 1988).

4. Astronomy (Falak)

Astronomy enters the Islamic world through the works of *Indian Sindhing* which translated by Muhammad Ibn Ibrahim Al-Fazari (Death 777 AD). He was the first Islamic astronomer whomade Astrolabel, a tool for measuring stars' stellar. This science flourished in Baghdad, and the observatory was founded not only in Baghdad but also in Damsyik, Cairo and some cities in Andalusia. later translated Greek books, such as Ptolemy and Archimedes. Thus, the names of the astronomers of Islam, such as All bin Isa Al Astirlabi, whose name implies the maker of Astrolabel, Abu al-Abbas Ahmad Al-Farqani, who is known in Europe as Alfragenus, Abu Abdillah Muhammad Ibn Jabir Al-Battani whose name in Europe is Albatengius, Abu Al-Raihan Muhammad Ibn Ahmad Al-Biruni (973-1048 AD), Umar al-Khayam (1048-1123 AD) and Nasir Al-Din Al-Tusi (d. 1274 M).

Al-Farqani's writing entitled *al-Madkhalilaha'ati 'ilmil-falak* was translated into Latin in 1135 AD by Yohannes Hispalensis and Gerard from Kremona who had influence in Europe for seven hundred years. According to Lelande, a famous French astronomer in the XVIII century AD that al-Battani is one of the twenty famous astronomers in the world. Al-Battani made some corrections to Ptolemy's

opinions which also made improvements to the orbits of the moon and several other planets. His greatest book on astronomy is translated into Latin, and it is known in the West as *De Scintia Stellarum*. (Basalamah, 58: 1988).

5. Optical

Optical science that discusses the problem of human vision also develops in the Islamic scholars. The greatest name in this science is Abu Ali al-Hasan Ibn Haisyam (Al Hazen) 965-1039. His most important book is *Al-Manazir*, which was translated into Latin and was published in 1572 AD.

Haisyam opposes the theory of Euclid and Ptolemy which stated, it is the light that sends light to matter. Therefore it can be seen. Instead, he argues that the matter sending light to the eyes by the process of delivery, then bring the thing arises an image in the eye. He also addresses the problem of light, the color of the illusion of view, reflection, and so on. Haisyam experimented a lot, and his experimental results almost led him to the discovery of a magnifying glass.

Besides *Al-Manazir* Haisyam also wrote book *AlMuntakhab Fi Ilajil-ain* which contains some important discussion about eyes treatment. He also wrote a little book on light, rainbow, and the circle of light around the moon and the sun. His book on *Twilight Phenomenon* its Arabic text is no longer found, and there is only a Latin translation. He explains that the atmospheric height according to the calculation is about 15 kilometers. Haisyam also wrote a commentary on Euclid's and Ptolemy's essays, on Aristotle's physics. (Basalamah, 63: 1988).

B. Western Scholars' Recognition on the Muslim Thought Contribution toward the Process of Scientific Progress in the Western.

As it is known that the sciences of Muslims thought come into Europe through Andalusia and Sicilia. Arabs and Muslims really know the meaning and usefulness of science in culture. Therefore, they really devote their energy and mind in an effort to preserve the integrity of the works of the relics of the scientists who preceded them, especially the Greek and Indian scientists. Their attention was paid to the translation movement of the existing science books into Arabic.

The Europeans who knew the meaning of the Eastern culture immediately followed Arabs. First, they studied Arabic, then looked for a book of works and translations of Arabs, and books of Hypocrites, Galen, Archimedes, and Euclid.

Dealing with this, The European Science and interpretation center is Toledo, when Toledo became the capital of the Christian government, they founded the House of Wisdom like Baitul-Hikmah in Baghdad. They imitate the khalifah Al-Makmun, in Toledo gathered renowned translators, such as Raymond, Avemdeath (the original name is Ibn Dawud) and Gerard of Cremona (Italy). Gerard went to Toledo looking for a job as a translator. He is well-versed in Arabic and manages to translate Arabic-speaking books of knowledge into Latin. People call Gerard Cremona as the Father of Arabic Translator in Europe. Gerard had translated 80 books from Arabic into Latin. Other Arabic translators are Mark from

Jews. Rufirio from Italy who was attracted to Hunain bin Ishaq's essay. Simon from Genoa who is interested in Al-Zahrawi's book. (Thaha, 63: 1983).

The Arabic language is deeply influential in southern Europe, especially in Sicily and Spain, since it has once been the center of Islamic civilization with the universities such as; Cordova, Sevilla, Malaga, and Granada (VII-XIII century AD). The students who studied in Spain eventually developed knowledge throughout Europe, after they succeeded in transferring the results of Muslim thought to the Western world, which later became a modern science. (Thoyin, 6: 1988).

To prove the contribution of Muslims thought in the process of advancement of knowledge in Western, this follows in the presentation of some western scientists' statements:

- 1) Dr. Max Meyershof states that "Islamic medicine and sciences, generally illuminates Hellenism to its fading light. Then Islamic science became the moon in the pitch-dark night of Europe, ushering Europe into the Renaissance. That's why, Islam is the main source of movement, which is owned by Europe now". (Hoesin, 80: 1975).
- 2) Diorant said for the Crusades that "Christian patients prefer Muslim doctors rather than Christian doctors. (Thaha, 67: 1983)
- 3) G libon writes that "it is the Arabs who cause us (the Europeans) to have civilization. They are our teachers for six centuries. (Libon, 579: 1964)
- 4) Henry Treece states that "when Muslim just got little studies from Western, but Europe inhale back almost all the cultural and sciences from Suriah (Eastern)". (Nasution, 69: 1980).

9. Conclusion

From the above explanation can take a conclusion that the contribution of Islamic thought to the progress of modern science is a historical fact that can be tracked by two points:

- 1) The translation movement of the general book of knowledge from the Arabic language of the Latin language: this translation movement is done by many westerners on the works of Muslim scientists such as Ibn Sina, Al-Khwarizmi, Al-Farabi, Ibnu Rusyd, and so on. The copied manuscripts cover a wide range of scientific literature such as medicine, chemistry, mathematics, astronomy, optics and various other disciplines. This translation movement has changed the western science to this day.
- 2) The recognition of western scholars about the contribution of Muslim thought in the process of scientific progress in the West: the statement as mentioned above shows that the efforts of the Muslims in order to master and develop science through the writings that use the Arabic language has gained recognition from western people.

References

- [1] Thawil, Abd. Syakur. 1989. Sumbangan pemikiran islam terhadap peradaban modern dan perkembangannya di duna internasional. Adab faculty IAIN. Surabaya

- [2] Elis, C Kail, *New Catholic World*, December 1988, p 272
- [3] Dewan dakwah islam indonesia, brosur sosial media dakwah, nomer 21, p 25-27
- [4] Sekotore and jommo kenyakita, *Muslim Journal*, June 16, 1989, p 6.
- [5] Mallon, Ellias D, *New Catholic World*, December 1988, 245.
- [6] Boadt, Lawrence, *New Catholic World*, December 1988, 242.
- [7] Muzammil, *New Catholic World*, December 1988, 255.
- [8] Basalamah, ali abu bakar. *Bahasa arab diantara bahasa-bahasa dunia*. Makalah seminar nasional bahasa arab, UGM Yogyakarta. 1988
- [9] Al-sallus, ali ahmad. *Dirasat fissaqofatil al-islamiyah*. Maktabah al-falah: kuwait. 1982
- [10] Thaha, ahmadi. 1983. *Kedokteran dalam islam*. Pt bina ilmu: surabaya.
- [11] Nasution, harun. 1980. *Akal dan wahyu dalam islam*. Universitas indonesia: jakarta.
- [12] I.M, Thoyib, 1988. sumbangan bahasa arab dalam proses kemajuan ilmu pengetahuan masa kini dan yang akan datang, Makalah seminar nasional bahasa arab, UGM Yogyakarta.
- [13] Hoesin, oemar armin, *kultur islam*. Jakarta. 1975
- [14] Lebon, gustave. *Hadorutul arab*. Isa al babi al halabi: kairo. 1964.

