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Islam and Science: Integration of Religion and Science to Build a Second Islamic Golden Age

İslam ve Bilim: İkinci Bir İslami Altın Çağ İnşası İçin Din ve Bilimin Entegrasyonu

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Öz

Müslüman ülkelerin bilimde yüzyıllardan beri geri kaldığı bilinmektedir. Bugün tüm İslam ülkeleri Batı'yı yakalamak için çok yoğun bir bilimsel çaba içine girmişlerdir. Peki Batı'yı yakalamamıza ne kadar bir süre kaldı? İşte bu sorunun cevabını bulmak için bu çalışmada 2016-2020 yılları arasında öncü İslam ülkelerinin bilimsel üretkenliği Batı ülkeleri ile karşılaştırıldı. Ayrıca dinin bilimsel üretkenliği engelleyip engellemediğini değerlendirmek için orta üst ve orta alt gelir grubundaki Hıristiyan, Müslüman, Budist ve Hindu ülkeler arasında karşılaştırmalar yapıldı. Öncü Müslüman ülkelerin onca ilerlemeye rağmen Batı'dan hala çok geride olduğu, bu şekilde devam ederlerse Batı'yı hiçbir zaman yakalayamayacakları gösterildi. Başta İslam olmak üzere dinlerin hiçbirisinin bilimsel üretkenlik için özel bir engel teşkil etmediği ortaya kondu. Bu sonuçlar İslam ülkelerinin bilimsel üretkenlikte çok ciddi artışlar yaptığı ve yakında Batı'yı yakalayacakları algısının bir yanılgı olduğunu göstermektedir. Eğer Müslümanlar bilim ve teknolojide Batı'yı yakalamak istiyorlarsa geçmişte yaptıkları gibi bir altın çağ inşa etmeliler. İslami Altın Çağda alimler din ve fen bilimlerini birlikte icra etmekteydiler. Bugün yapılması gereken geçmişten ilham alarak din ve bilimin entegre edildiği bir üniversite modelini hayata geçirmektir.

Anahtar Kavramlar Eğitim, Bilimsel gelişme, Müslüman, Yayın, Din.

Islam and Science: Integration of Religion and Science to Build a Second Islamic Golden Age

Abstract

Today, all Islamic countries are undertaking intense scientific efforts to catch up with the West. So how long until we catch up with the West? The scientific productivity of leading Islamic countries was compared with Western countries in 2016-2020. Comparisons were also made between upper-middle and lower-middle-income Christian, Muslim, Buddhist, and Hindu countries. It was shown that the leading Muslim countries are still far behind the West despite all their progress and that they will never be able to catch up with the West if they continue in this way. It has been demonstrated that none of the religions, especially Islam, pose a particular obstacle to scientific productivity. These results show that the perception that Islamic countries significantly increased their scientific productivity and will soon catch up with the West is a fallacy. If Muslims want to catch up with the West in science and technology, they must create a golden age as they have done in the past. In the Islamic Golden Age, scholars used to practice religion and science in an integrated manner. What needs to be done today is to implement a university model in which religion and science are integrated with inspiration from the past.

Keywords: Education, Scientific development, Muslim, Publication, Religion.

Introduction

In his book, Pervez Hoodbhoy (Hoodbhoy, 1991) demonstrated that the indicators of scientific development in Muslim countries are lagging behind, even when compared to third world countries. Despite confirming this depressing scientific situation in his preface to the book, Professor Abdus Salam, winner of the Nobel Prize in physics, stated that "there is still hope". It has been 30 years since the publication of the book. Today, when any person is asked level of the Muslims in science, regardless of them being just a person on the street, a scientist at a university, or an administrator at an institution, their answers will be similar: "The Islamic world has fallen behind the West in science." When asked if this is caused by Islam, almost everyone will respond: "No, Islam is not against science". The answers to the question "So why have the Muslims fallen behind in science?" are similar: poverty, mismanagement, laziness, nepotism and disregard for merit, factionalism, political divisions, *et cetera*. When scientists are asked the same question, they will address low salaries, difficult working conditions, limited research funds, excessive procedures, career pressure, the weakness of scientific freedom, *et cetera,* in addition to the previous responses. The responses of the administrators will not differ much from ordinary people or scientists. On the other hand, a perception that significant progress has been made in recent years and that the West and other developed countries will be caught in the near future has begun to spread. So, is the state of science in Islamic countries poor, or have we caught up with the West? In a report prepared recently at the request of the Organization of Islamic Cooperation, the scientific situation of Islamic countries was discussed (Hamid, 2015). This report is one of the most comprehensive analyses of the state of science education and research in 57 Muslim-majority countries that are members of the Organization of Islamic Cooperation (OIC)(Rehman, 2015). The report states that the Muslim world fell behind in most indicators of scientific output and productivity and underperformed significantly relative to population size.

All current studies are in agreement that the Muslim world is in a dismal state in the production of science and technology (Dallal, 2010). So, was the Islamic world always far behind in science since the beginning of Islamic history? Contrary to popular belief, the Early Middle Ages is a period when history, in every field and every form, was possessed by the East and Islam, between the VIII-XI centuries in particular (Lombard, 1975). So much so that science has not been as popular as it was in the medieval Islamic society in any society and civilization except modern times (Dallal, 2010). This period, in which scientific activities such as thought, research, and innovation were extensive, lasted for more than four centuries (Starr, 2013). This period, referred to as the Islamic Golden Age, lasted for 500 years according to the commonly held view in the scientific world, and the decline in science began in the 1200s. Some scholars have also argued that the Golden Age lasted much longer. According to George Saliba, Islamic science continued to be active until the midpoint of the 1500s, especially in the fields of astronomy and medicine and was still abreast with Western science in the 16th century (Saliba, 2007). Knowledge, experiences, theories, and tools inherited from other cultures have been used and developed in the Islamic cultural circle. Moreover, by creating new inventions and new knowledge spheres, the field of science has been expanded tremendously, and a very high level was reached. This process of scientific production and creativity continued for 800 years and was maintained until the mid-16th century (Sezgin, 2016).

With the advent of Islam, the Arabs established a sublime Arab-Islam civilization in a very short time that spanned the entirety of the Middle East, North Africa, and Central Asia. Over time, with the conversion of non-Arab societies to Islam, this civilization gained the identity of an Islamic civilization. In reality, pre-Islamic Arab society was a nomadic society, and although they were not primitive in religious, urban, and administrative spheres, they were underdeveloped (Lapidus, 2002). Before the rise of Islam and for a century after, there was no scientific production among the Arabs, and in the early Islamic period, the Arabs were like a blank slate (Dallal, 2010). That noble Arab tribe was an ummah in the age of ignorance (Nursi, 2014b, 30). However, the fact that they managed to rule the peoples of great civilizations such as Egypt, Greece, and Iran after a short time shows that the Arabs were not much far behind these civilizations, at least in terms of thought (Sezgin, 2016). With the advent of Islam, the Arabs entered a great spiritual awakening and enthusiasm. They had a strong thirst for knowledge, paralleling both their spiritual enthusiasm and their self-confidence from victories (Turan, 2015). Thus, religious thought and understanding originating from the essence of Islam supported science (Dallal, 2010). According to Franz Rosenthal, if Muslims had adopted science for practical purposes, it would not have developed so quickly and extensively, and, on the contrary, Muslims practised science as a requirement of their faith (Turan, 2015). The rise of positive sciences in the Islamic state started with the Arabization of the bureaucracy by the Umayyad caliph Abd al-Malik (Saliba, 2007). The translation of one of the works of the Greek alchemist Zosimos into Arabic in 658 during the reign of Muawiya, the governor of Damascus, indicates that the interest in translation started long ago (Sezgin, 2016). The Arabization movement during the reign of Abd al-Malik directed non-Arab people who sought to find a place in the administration to science and translation. This process affected Arabs and Arabic speakers over time, and thus the process of acquiring science, which started with translation, turned into the production of science. Muslims who emerged with a new conviction translated Greek science books with great courage, self-confidence, thirst, and love, especially during the Abbasid period (Gutas, 2012; Turan, 2015). During the Islamic Golden Age, many great scholars who wrote their own compiled works were trained: Ibn Sina, Al-Biruni, al-Razi, Ibn Rushd, Ibn al-Haytham, al-Khwarizmi, and hundreds of other great scientists. Abubakr al-Razi's medical and pharmacology corpus called *Al-Kitab al Hawi* has been the undisputed medical authority in Europe until the 17th century (Sezgin, 2016). Avicenna's famous book *Al-Kanun fi't-Tıb* has been reprinted so many times in the West that it has become the bible of modern medicine. Khwarizmi made the Indian decimal system usable and introduced algebra as an independent field of science for the first time. Al-Biruni was the greatest social scientist between Thucydides and the modern age (Starr, 2013).

1. Research Method

In this section, the number of publications and citations made by leading Muslim countries and other countries in the last five years (2016-2020) was compared. Publication and citation numbers were obtained from The SCImago Journal & Country Rank database (*SJR : Scientific Journal Rankings*, 2016-2020). Country populations and per capita income information were obtained from The World Bank database (*DataBank | The World Bank*, 2016-2020). The religious distribution of the people living in these countries was obtained from the Pew Research Center database (Pew Research Center, 2014). Religiosity index information was obtained from the Pew Research Center database and the GALLUP database (Crabtree, 2010; Pew Research Center, 2018). The World Factbook database was searched for the religious and ethnic distribution of these countries (*The World Factbook - The World Factbook*, 2020). The Times Higher Education database was used to rank the world's top 400 universities (*World University Rankings*, 2019/2020).

The following criteria were used to compare scientific levels across countries: publications per million population, citations per publication, total annual publications/national income per capita, and publication efficiency per million population. Publication efficiency value is the number of publications per million people multiplied by the number of citations per publication. The aim is to combine the number of publications per million people with the citations per publication and obtain a more comparable benchmark. It is argued that the number of publications is insufficient to show scientific production, and the number of citations is of greater importance. However, the researchers showed that the percentage of citations that reflect the true impact of an article is 12.4% of total citations on average and is not related to the impact factor of the journal in which the cited articles were published (Aroeira & Castanho, 2020). Therefore, using quantitative cumulative citation analyses alone is not sufficient to draw conclusions about the scientific impact of publications. The true contribution of a published study to the development of new knowledge and to the advancement of science can be determined by careful analysis of how the work described in the articles fits into subsequent studies and/or the results of others (Aroeira & Castanho, 2020).

In the country selection, the United Kingdom, Germany, and France were selected among the developed countries. These three countries are the symbol countries of the Renaissance, Enlightenment, and Industrial Revolution in Europe. To compare with these countries, four countries that publish the most in the Islamic world were chosen: Iran, Turkey, Saudi Arabia, and Malaysia. The following non-Western civilizations that fall into the developed country category were selected: Japan, South Korea, and China. Religion and ethnicity were not considered in these comparisons. In the next comparison, the effect of religion on the level of scientific development was examined. Certain upper and middle-income countries were chosen for this comparison: Albania, Lebanon, Thailand, Iraq, Mexico, Brazil, Romania, Malaysia, Turkey. Then, the following countries were selected from the lower and middle-income groups: Philippines, Indonesia, Bangladesh, Myanmar, Pakistan, Egypt, Nepal, Sri Lanka, Vietnam, Ukraine, Bolivia. The purpose of comparing states with different religious beliefs is not to prove the superiority of Islam or any other religion. The main purpose is to show that the religion of Islam does not constitute a special obstacle to scientific development. For this, countries with predominantly Muslim, Christian, Buddhist, and Hindu populations were compared. To make a comparison between universities, the universities of Muslim countries, which are in the top 400 in the world, were examined based on the 2019/2020 edition of the Times Higher Education world university rankings.

The gradient of the countries' publications per million population between 2000-2020 and 2016-2020 was compared to predict whether Muslim countries can catch up with Western countries in science (SJR : Scientific Journal Rankings, 2000-2020; DataBank | The World Bank, 2000-2020). The intersection points of the lines were calculated using the gradient equations.Microsoft® Excel Office 365 program was used for statistical analysis.

2. Results

When the number of publications per 1 million population was compared in Table 1, it is seen that developed countries publish 4 to 5 more times than Muslim countries. Only Malaysia was able to reach half the number of publications of developed countries. When compared in terms of publication efficiency, it is seen that the efficiency in developed countries is 2 to 15 times higher. In terms of publication efficiency, Saudi Arabia was able to reach half the level of France. In terms of the number of publications per 1 million population, Malaysia is in a similar situation to Japan, a developed non-Western country. In terms of publication efficiency, Saudi Arabia and Malaysia are similar to Japan. Iran has a higher efficiency than China, and Turkey and China are similar in terms of efficiency. The number of citations per publication is partially directly proportional to the per capita income. Wealthy and developed countries have a higher number of publications per million population, as well as a higher number of citations per publication. Saudi Arabia, on the other hand, surpassed Islamic countries, even Japan, France, and Germany, in terms of the number of citations per publication.

When we look at the number of publications per million population between 2000 and 2020 in Graph 1, the x-coefficient of developed countries on the gradient line is higher than that of Islamic countries. Even if it is assumed that all countries start from zero, both the x-coefficients and R^2 values of developed countries are higher. Therefore, they have a greater momentum in terms of the increase in the number of publications over the years. When we calculate the gradient equations for the years 2000-2020, 93 years are required for Malaysia to catch up with France in the following years, but it is not possible for Malaysia to catch up with Germany and the United Kingdom. It will never be possible for Saudi Arabia, Iran, and Turkey to catch up with these three developed countries.

In Graph 2, assuming that Islamic countries have allocated more resources to scientific studies in recent years, a graph of the number of publications per million population was created only for the last five years, that is, between 2016-2020. According to this, it will take 57 years for Malaysia to catch up with France, and it is not possible for Malaysia to catch up with other countries. It will take 20 years for Saudi Arabia to catch up with France, and it will catch up with Germany 69 years later. It will take 86 years for Iran to catch up with France, but it is not possible for Iran to catch up with Germany and England. It could be said, based on the gradient between 2016-2020, that it will never be possible for Turkey to catch up with any of the three developed countries.

In Table 2, upper and middle-income countries of different religions, regions and races were analysed. When the upper- and middle-income Muslim country of Iraq and the Buddhist country Thailand were compared, it was noted that they were similar in terms of the number of publications per one million population, with Thailand being slightly better than Iraq in terms of publication efficiency. In Table 3, when the two neighbouring states, Muslim Bangladesh, and Buddhist

Myanmar, were compared, the number of publications in Bangladesh was more than three times that of Myanmar, and the publication efficiency in Bangladesh was twice as much as that of Myanmar.

When Romania and Mexico, two countries with similar income levels, were compared in terms of the number of publications per 1 million population, it was found that Orthodox Romania had four times more publications than Catholic Mexico. A similar situation exists in terms of publication efficiency. Again, Orthodox Romania had a much higher number of publications per capita than Catholic Brazil, and its publication efficiency was much higher. Orthodox Ukraine, which is in the lower-middle-income group, had a higher number of publications than Catholic Bolivia and Catholic Philippines. On the other hand, Catholic Brazil had twice the number of publications per capita than Catholic Mexico, and the publication efficiency was also twice as high.

Malaysia and Turkey are countries in the upper- and middle-income group. These two Muslim countries are at the same income level as Romania, Mexico, and Brazil. The number of publications per million population was higher in both Malaysia and Turkey than Brazil and Mexico, and publication efficiency in Turkey was two times that of Mexico and similar to that of Brazil. Romania had a greater number of publications and a higher publication efficiency than Turkey. When the two low-income island countries, Catholic Philippines, and Muslim Indonesia, were analysed, it was found that Indonesia had 3-fold the number of publications per capita than the Philippines, but they were similar in terms of publication efficiency.

When Hindu Nepal and Buddhist Sri Lanka, which are in the lower- and middle-income group, were compared, the number of publications in Sri Lanka was twice that of Nepal. Vietnam, where most of the population are followers of local religions, had fewer publications than Orthodox Ukraine and much more than Catholic Bolivia. Likewise, Vietnam had the same number of publications per million population as Buddhist Sri Lanka and Muslim Pakistan. The number of publications in Vietnam was half that of Muslim Egypt, and the publication efficiency in Vietnam was one-third of that in Egypt. The number of publications in Vietnam was three times that of the Catholic Philippines and Muslim Bangladesh.

In Table 4, when we look at the 2019/2020 edition of the Times Higher Education world university rankings, there are only eight universities from the Islamic world, and there are no universities from the Islamic world in the top 200 university rankings (World University Rankings, 2020). Of these eight universities, five were in the Arab countries (2 in Saudi Arabia, 2 in the United Arab Emirates, and 1 in Jordan), one was in Malaysia, 1 in Iran, and 1 in Turkey.

3. Discussion

3.1. The Current State of Science in the Islamic World

Pervez Hoodbhoy reported that Muslims are behind third-world countries in terms of scientific development despite higher per capita income (Hoodbhoy, 1991). The most satisfactory result of this study we conducted after thirty years is that Muslim countries are not behind the developing countries and are even ahead of some countries. Also, being a Buddhist or a Muslim is not a reason for being behind in terms of scientific development. Again, the religion of Islam and Christianity is not a particular obstacle to scientific development. While developed and newly developed countries are mostly secular, that is, non-religious societies, developing countries are more religious societies. However, when we look at Vietnam, it is seen that the majority of the people (74.9%) do not have an institutionalized religious belief (Unaffiliated 29.6%, Folk Religion 45.3%) (Pew Research Center, 2014). Again, Albania (15%), which has a low religiosity index, is not scientifically more advanced than Lebanon (57%), but even behind it.

In 2015, researchers demonstrated that Islamic countries and developed countries with similar income levels published more scientific articles in the 2006-2015 period compared to the previous (1996-2005). While Israel, Brazil, and South Korea had a slight increase in the number of publications (1 to 3 times), Muslim countries such as Qatar, Iran, Pakistan, Malaysia, and Iraq achieved dramatic increases (5 to 8 times) (Hamid, 2015). Most other Muslim countries also improved their output by 2 to 3 times. These dramatic increases in the number of publications were promising in terms of catching up with the West. When we look at the gradient of the publication curves to verify this, it is seen that the situation does not meet the expectations. The number of scientific publications and lines of the gradients show that Muslims can catch up with the West in 20 years at the earliest (Saudi Arabia). In fact, considering the trajectory of the publication curves, it does not seem possible for any Islamic country to catch up with the UK. In their study, in which they examined the productivity of researchers in Arab countries, the researchers showed that the number of medical publications increased three times between 2007 and 2016, but this is still far behind that of the developed countries (El Rassi, vd, 2018).

The number of citations per publication is partially directly proportional to the per capita income. Wealthy and developed countries have a higher number of publications per million population, as well as a higher number of citations per publication. However, the number of citations per publication of Muslim countries was found to be significantly lower than peer countries with similar levels of income (5 countries Israel, Brazil, Spain, S. Africa, S. Korea) (Hamid, 2015). In this study, we found that Muslim countries were drawing closer to developed countries in terms of the number of citations per publication, and, as a matter of fact, Saudi Arabia surpassed developed countries except for the United Kingdom. This shows that the quality of publication in Islamic countries has increased compared to before 2015.

In this study, we did not analyse the number of reference publications from the relevant countries. A recent study demonstrated that only 1,087 (3.41%) of a total of 31,917 reference publications indexed in SJR in 2018 belonged to countries that are members of the Organization of Islamic Cooperation (Haq & Tanveer, 2020). Most of the reference publications are published by six countries, which are Turkey (n=219), Egypt (n=216), Iran (n=174), United Arab Emirates (n=131), Pakistan (n=97), and Malaysia (n=95). Of 57 OIC member countries, 29 do not have any reference publications indexed in SJR.

The number of universities in Islamic countries in the top-400 list did not increase in the last five years. The interesting thing is that Turkish universities fell behind and were replaced by Arab universities. Five years ago, there were 6 Turkish universities in the top-400 list and no Arab universities (Hamid, 2015). Today, on the other hand, there are 5 Arab universities in the top-400 list and no Turkish universities. According to this, ethnicity is not a determinant of scientific progressiveness or backwardness of the society.

3.2. An introduction to the building of a second Islamic golden age

As mentioned in the introduction of the article, Muslims created a great Golden Age in the first 500 years of Islam. The primary feature of this golden age was the extensiveness of scientific activity. Science was given such a tremendous value that, prior to modern times, no society and civilization except modern times prioritized science as much as the medieval Islamic society (Dallal, 2010). Then, if we learn from the past, can we create a golden age once more? If we can understand the reasons for the love of science at that time and adapt the upbringing of the scientist of those days to today, we may have an opportunity for the second golden age.

What was the source of the love of science at that time? Arabs were an illiterate society in the age of ignorance, and they were like a blank page (Nursi, 2014b; Dallal, 2010). With the advent of Islam, they made all their emotions and motivations directed to the intention of knowing and understanding their religion. This was not to reach for the universe from the perspective of wisdom and philosophy but rather to act as a complementary element and to reach for a new outcome in the light of the evidence. The Arabs, who were the children of a large and calm geography, were trained and disciplined only with the Qur'an. And so, as the Arabs embraced new countries, religions, and societies, they took their knowledge without hesitation. Since the knowledge contained in the Qur'an was superior to all knowledge, they were not worried about acquiring new knowledge (Nursi, 2014b). The source of their love of science was their absolute and pure faith in the Qur'an. Today, many ideas and opinions coming from philosophy, Judaism, and Western civilization have led to many doubts and hesitations in the Islamic faith. Muslims have sufficient belief neither in the primary pillars of Islam nor in science.

What was the most basic characteristic of a Muslim scientist in the past, and what kind of education did he receive? The most fundamental characteristic of the scholars of the golden age is that they were engaged simultaneously in both religion and science. At the same time, almost all the scholars were religious and were engaged in religious sciences. These scholars produced respectable works in the field of religious sciences as well as important works in the field of natural sciences. Almost all the scientists of this golden age were multi-disciplinary scholars working in multiple scientific fields (Starr, 2020). Religious and multi-disciplinary scholars who were educated during the golden age were not trained in institutionalized educational institutions. These scholars took one-to-one lessons from independent scholars during their student years. Scientists were able to freely move, research, and write in their fields of interest. However, since the first madrasas, where education was institutionalized, religious sciences and religious scholars dominated the institutions. It is understood that the decrease in the number of scientific books with empirical content coincided with the emergence of institutional education structures and madrasas. Chaney demonstrated that the decline in scientific output coincides with an increase in the proportion of writers affiliated with madrasas (Chaney, 2016). Therefore, the unity of religion and science embodied in the person of scholars in the golden age has never been embodied in institutional education. In the golden age, jurists, theologians, and hadith scholars gave lessons in mosques and houses of science (Mez, 2000). Natural sciences education, on the other hand, was mostly given in private foundations and houses, but at the same time, scholars taught sciences alongside religious science in mosques (Dallal, 2010). The science council was open to everyone. The teachers used to give their lessons by dictating to the students, but later, they started to give lessons based on books. The fact that mosques were not suitable for the debate method, which was becoming widespread, gave rise to the schools of education, that is, the madrasas. Scholars did not practice a profession other than science. Those who did not receive a regular salary made a living by working as scribes or through certain monetary aids. Since there were no institutional structures, private lessons and teaching were common. Wealthy families, city administrators, prominent individuals, bureaucrats, and viziers hired private tutors for their children. At that time, most scholars were equally specialized in both the intellectual sciences and the religious sciences. For example, Nishaburi wrote books on tafsir and astronomy, Ibn al-Nafis on hadith and medicine, Ibn al-Baytar on medicine and fiqh, Sadr al-Shari'a al-Asghar on kalam and astronomy (Dallal, 2010).

3.3. A new University Model: The İntegration of Science and Religion

Regardless of them being successful or not, almost all universities in the world are different versions of the secular education system originating from the West. As in the rest of the world, a strictly secular education model is implemented in universities in the Islamic world (Mimouni, 2015). While the secular education system model has been successful in the Western countries that developed the system itself and in the secularized Far East throughout history, it has not been successful in Islamic countries. It is understood that the secular education model is not a cure for the backwardness of Islamic civilization.

The secular education system does not recognize the existence and judgment of a Creator. It treats man as an independent being from the Creator. Man is an advanced animal that has grown up in the arms of nature, constantly being evolved by nature and developing, and possesses mental and psychosomatic features. This education system is based on a secular belief in which nature is comprehended as a self-balancing creature that chooses the strong and eliminates the weak. There is a kind of vitality and power assigned to nature. It accepts that natural events occur in a cause-and-effect relationship. It attributes the realization of effects to the causes themselves: it assigns a kind of vitality and intelligence to the causes (Nursi, 2014a). He also attributes the realization of extraordinary events to coincidence, believes in coincidence and chance. As can be seen, the secular mind ascribes vitality, intelligence, and strength, which have a kind of creative quality, to causes, coincidence, and nature. These attributions are superstitious according to Islamic belief because there is no creator other than Allah, and Allah is the sole ruler and ruler of all creation and existence.

Said Nursi said that the secular scientific education model would lead to deceit and scepticism, while religious science education alone would cause bigotry. Nursi emphasized the necessity of teaching religion and sciences together at the university level in the early 1900s (Nursi, 2014c). Nursi expressed his basic doctrine for this new model university as "The light of conscience is religion. The light of the mind is the science of civilization. With the reconciliation of these two, the truth is manifested." According to him, if religion and science are taught together, students' desire to learn and their effort to study will increase very rapidly. The university project called Madrasat-uz-Zahra was presented to the Ottoman Sultan Mehmet Reşad in 1911 and accepted (Vahide, 2012). In the project, it was planned to establish the university in religiously sectarian eastern cities of Turkey and to accept students from all Islamic countries. The language of education would be mainly Arabic. Students would learn religious sciences and natural sciences at the same time. The foundations of the university were laid in the city of Van in 1913, but after the start of the First World War, the project never found the opportunity to be implemented. There are some calls that the aforementioned Madrasat-uz-Zahra university model should now be implemented (Aksoy, 2014; Jamshed, 2016).

Various solutions have been proposed for the failure of the secular education model in Islamic countries. In the report prepared by the Organization of Islamic Cooperation, scientists suggested re-analysing the Islamic Golden Age to solve the problems (Hamid, 2015). For example, Lee Yee Cheong proposes the integration of science and technology with the public by taking inspiration from the Islamic Golden Age (Cheong, 2015). If the student's interest in science and technology connects him to his own religion, culture, and historical heritage, interest in science will increase dramatically. The school curriculum should be shaped by considering that scholars in the Golden Age of Islam were both polymaths and religious scholars, poets, astrologers, musicians, astronomers, and engineers to create a science-oriented character. Dzulkifli bin Abdul Razak also strongly recommends taking inspiration from the Islamic Golden age, and even imitating it (Razak, 2015). Razak points out that in the golden age, science and religion exhibited a high degree of harmony, and most Muslim scholars were equally knowledgeable in both science and religion. If the educational ethic of the golden age could be maintained, one would be able to explore the physical and spiritual world without any conflict in the search for truth with an equally "enlightened" soul. He says, "Today, we are at a crossroads for Muslims to do more than play the role of passive spectators, while other societies are busy reshaping the future of education and reinventing science. But above all, there is no doubt that we must restore faith as the main driving force." Jamal Mimouni stands off from the integration of religion and science in university education. On the other hand, he believes that the current science education does not have the desired effect on the minds of students in the Muslim world (Mimouni, 2015). Despite the effects of the secularization trend in modern Muslim societies, it is a fact that religious rules in Islam strongly affect society in general. Accordingly, courses such as the history of science that focus on the history of science in Islam and cross-referenced ecology supported by the Islamic teaching on environmental protection as a religious duty that bridge the gap between science and religion can be added to the curriculum of social sciences and humanities to soften the divide between science and religion. If Muslims want to experience another golden age, Islamic education must recall everything done by the Muslim scholars of the classical age (Subandi & Mahmoud, 2014). This is because ancient scholars considered science and technology an integral part of Islamic research and included them in the basic curriculum. If we want to realize the dream of a scientific resurgence in the Muslim world, we must carry out drastic reforms.

Otherwise, we will stay that way (Guessoum & Osama, 2015). For this dream to come true, we must take the Islamic Golden Age as our guide.

In this study, we propose, by taking inspiration from Nursi and suggesting an update to his model, a new university model that integrates science and religion in which these disciplines will be taught together. We believe that, in the entire Islamic geography, there is a need for universities where religion and science are taught together. What is expressed here is not the presence of the separate faculty of religious sciences and the faculty of engineering under the roof of the same university. We suggest adopting the multi-disciplinary education that educated the scholars of the golden age in the past to today's conditions. This means that the students will learn religious sciences and natural sciences together. They will learn basic religious sciences as well as professional knowledge of their chosen branch. This does not mean that the computer engineer will also become a scholar of tafsir or hadith. Such a student will also take religious lessons in the method of tafsir, hadith, and fiqh. The purpose here is for a computer engineer to have knowledge of the basic rationale and the essence of Islam. The student will comprehend Islam in a pure and holistic way, not in an imitational and superficial way.

Students will not receive science education in a religious format but in a secular format similar to how it used to be in the past. Students will continue to learn the whole science process by believing in the absoluteness of the law of cause and effect. Only some errors in the secular approach will be corrected. For example, secular education attributes the realization of the outcomes in nature to the causes themselves and thus gives a kind of vitality and consciousness to the causes. The reason for the faulty understanding here is that the same constant manner of ordering and the origination of the processes gives the causes and the nature a form of vitality, intelligence, and will (Nursi, 2014a). However, nature is the manifestation of the strength and laws in God's sphere of knowledge, in the sphere of the body (Nursi, 2007). For example, the stone is found in the form of the "idea of stone" in the sphere of knowledge and rises to the sphere of existence/possibility with the "law of being a stone." Just as the “idea of stone” is a divine order, the “law of being a stone” is a divine law. Nature and existence processes are always obliged to the divine order and the divine law (Nursi, 2014b).

It is obvious that religious people, as well as secular people, do not understand that the cause-effect relationship is a law of God (Allah). Namely, in my academic life, I have witnessed that many academics do not believe enough in the law of cause and effect. While some of these scholars were not religious, many were religious people. They viewed science as a Western-invented curriculum, only carried scientific research for their careers. I have seen religious academics who have studied abroad regress to a similar attitude a few years after returning to the country. This weakness in our understanding of religion influences religious people who are educated at home and abroad, and non-religious people are negatively affected by this environment. However, it is a fact that non-religious people who grew up in a secular family for several generations believe more strongly in science and the law of cause and effect. In addition to the mistakes in the secular understanding, the mistakes in the religious understanding, such as the belief of tawakkul, will be taught by correcting them. The history of an arbitrary and limitless understanding of tawakkul, which is included in the literature as "Islamic fatalism", that is, "like the dead in the hands of a gassal" (like a dead person in the hands of a person who washes the dead), goes back to the 10th century (Nicholson, 1914; Mez, 2000). If the individual refuses to completely abide by the order between causes to reach a certain conclusion, then this is a lazy form of tawakkul. What is required by Islam is the submissive form of tawakkul that arises because of not interfering with the duty of the divine. Placing one's faith in Allah like a believer is to expect the outcome from Allah and to surrender to Allah after meeting the necessary conditions and doing the necessary work (Nursi, 2014c).

Every problem we encounter in nature is a question for us to find the answer to. For example, investigating climate change, global warming, and their effects on the world's creatures is a part of studying the universe. Muslims should be encouraged to explore the universe and know that they are responsible for figuring out how to better manage problems (Subandi & Mahmoud, 2014). God presents us with problems and wants us to solve these problems. For example, cancer is a question that the Creator asked us and wants us to find the answer to. When we find the cure for cancer, we answer the question. Scientists working in healthcare are responsible for finding answers to health-related questions. This understanding needs to be internalized by our scientists.

Conclusion

There is no known example in the world where religion and science are taught together at university-level schools. An example of this model at the high school level is the Imam-Hatip high schools (Aşlamacı & Kaymakcan, 2017). The curriculum of these high schools consists of 60% secular courses and 40% religious' courses. This ratio has mostly been maintained in all curricula prepared from the 1950s to the last few years (Aşlamacı, 2014). The majority of secular courses consisted of social sciences courses. Very few science courses such as physics, chemistry, and biology were provided in these high schools until recent years. For this reason, a comparison between secular and Imam-Hatip high schools will not be appropriate. Moreover, the duty of high schools is not to produce science but to prepare students for universities and similar level schools. The most important thing is the unity of religion and science education in universities and equivalent schools, which are the main institutions where science is learned and produced. The Imam-Hatip high school model can provide experience for a new university model which integrates religion and science that has increased autonomy. This new higher education institution integrated with religion and science can be named as medresite, referring to the integration of the madrasa and the university. The ratio of science and religion courses in the curriculum of the university to be founded should be determined differently depending on the fields. In Engineering and Health Sciences, the minimum share of religious sciences in the curriculum should be 25%. The ratio of religious education courses in social science programs may be less, but certain science courses should be included in the curriculum. We recommend a minimum 20% ratio of science courses in the curriculum in fields that provide religious education, such as theology. The rates we have suggested are preliminary estimates. These rates can be increased according to the efficiency of the university to be founded. In addition, students who have not received religious education may be asked to get more religious education in the form of preparatory classes or additional courses. Discussing the details of this university model is beyond the scope of this article. A separate study is currently being conducted concerning the details of the religion-science integrated university model. What we are alluding to is not the transformation of secular educational institutions in a country into a new religion-science integrated university model. On the contrary, the current secular education model needs to be preserved and maintained. In this article, we refer to the trial of the religion-science integrated university model by establishing several new universities. Time is running out. If we believe that the Golden Age of the past belongs to us and we trust our religion, we should start trying new things.

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Table 1. Scientific research outputs of developed countries and leading Islamic countries

Country	Religious commitment %	#Population	a Papers	b Citations	c GDP per capita	d Papers per 1 million (Pp1m)	e Citations per paper	f Papers/ GDP per capita	g Papers effectiveness per 1 million (PEp1m)
		Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20
France	11	67,076,912	135,374	1,059,121	39,251	2,018	7.82	3.45	15,790
Germany	10	82,848,988	203,963	1,611,078	45,306	2,462	7.90	4.50	19,446
U. Kingdom	10	66,436,483	233,963	2,358,352	41,397	3,522	10.08	5.65	35,498
Iran	78	81,788,986	62,812	375,036	3,954	768	5.97	15.89	4,585
Malaysia	77	31,526,625	35,327	178,816	10,654	1,121	5.06	3.32	5,672
Saudi Arabia	93*	33,665,956	27,112	228,138	21,454	805	8.41	1.26	6,777
Turkey	68	82,210,617	50,343	207,926	9,720	612	4.13	5.18	2,529
China	3	1,391,523,400	637,285	4,058,934	9,544	458	6.37	66.77	2,917
Japan	10	126,482,072	142,276	823,510	39,105	1,125	5.79	3.64	6,511
South Korea	16	51,535,205	90,808	615,379	31,533	1,762	6.78	2.88	11,941

*Gallup, 2009; # Annual average population between 2016-2020; a Annual average publication between 2016-2020; b Annual average citation between 2016-2020; c Average per year national income (GDP) between 2016-2020; d Annual average of publications per 1 million population between 2016-2020; e Annual average of citations per publication between 2016-2020; f The value obtained by dividing the average number of publications by the average per capita national income between 2016-2020; g Annual average of the number of publications per million population between 2016-2020, and the value obtained by the number of citations per publication.

Table 2. Scientific research output in Muslim, Christian, and Buddhist countries with upper-middle-income.

Country	Religion %	Religious commitment %	[#]Population	[a] Papers	[b] Citations	[c] GDP per capita	[d] Papers per 1 million (Pp1m)	[e] Citations per paper	[f] Papers/ GDP per capita	[g] Papers effectiveness per 1 million (PEp1m)
			Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20
Albania	Islam 80.3/ Christian 18	15	2,861,574	529	3,205	4,902	185	6.06	0.11	1,120
Lebanon	Islam 61.3/ Christian 38.3	57	6,814,843	3,759	30,817	7,181	552	8.20	0.52	4,522
Thailand	Buddhist 93.2	97*	69,407,029	18,903	90,456	6,978	272	4.79	2.71	1,303
Iraq	Islam	82	38,425,863	9,957	31,316	4,993	259	3.15	1.99	815
Mexico	Christian 95.1	45	126,161,954	28,180	149,714	9,202	223	5.31	3.06	1,187
Brazil	Christian 88.9	72	209,415,026	87,833	451,479	8,697	419	5.14	10.10	2,156
Romania	Christian 99.5	50	19,484,545	17,116	91,045	11,708	878	5.32	1.46	4,673
Malaysia	Islam 63.7	77	31,526,625	35,327	178,816	10,654	1,121	5.06	3.32	5,672
Turkey	Islam 98	68	82,210,617	50,343	207,926	9,720	612	4.13	5.18	2,529

*Gallup, 2009; [#] Annual average population between 2016-2020; [a] Annual average publication between 2016-2020; [b] Annual average citation between 2016-2020; [c] Average per year national income (GDP) between 2016-2020; [d] Annual average of publications per 1 million population between 2016-2020; [e]Annual average of citations per publication between 2016-2020; [f] The value obtained by dividing the average number of publications by the average per capita national income between 2016-2020; [g] Annual average of the number of publications per million population between 2016-2020, and the value obtained by the number of citations per publication.

Table 3. Scientific research output in Muslim, Christian, Buddhist, Hindu, and other countries with middle-lower-income.

Country	Religion %	Religious commitment %	#Population	a Papers	b Citations	c GDP per capita	d Papers per 1 million (Pp1m)	e Citations per paper	f Papers/ GDP per capita	g Papers effectiveness per 1 million (PEp1m)
			Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20	Mean of 2016-20
Philippines	Christian 92.6	91	106,637,167	4,599	26,129	3,247	43	5.68	1.42	245
Indonesia	Muslim 87.2	93	267,605,418	33,349	69,294	3,860	125	2.08	8.64	259
Bangladesh	Muslim 89.1	80	161,354,968	6,746	37,665	1,698	42	5.58	3.97	233
Myanmar	Buddhist 80.1	69*	53,718,251	645	6,195	1,315	12	9.61	0.49	115
Pakistan	Muslim 96.4	94	212,244,700	22,081	136,409	1,359	104	6.18	16.25	643
Egypt	Muslim 94.9	72	98,407,148	23,961	141,890	3,014	243	5.92	7.95	1,442
Nepal	Hindu 80.7	93**	28,147,469	1,899	13,117	1,095	67	6.91	1.73	466
Sri Lanka	Buddhist 69.3	99**	21,607,800	2,573	19,520	3,911	119	7.59	0.66	903
Vietnam	FolkReligion 45.3 Unaffiliated 29.6	30**	95,517,546	10,805	47,555	2,525	113	4.40	4.28	498
Ukraine	Christian 83.8	23	44,595,844	15,681	61,204	3,063	352	3.90	5.12	1,372
Bolivia	Christian 93.4	71	11,352,789	403	3,022	3,334	35	7.50	0.12	266

* Bridget Welsh and Kai-Ping Huang, 2016; **Gallup, 2009; # Annual average population between 2016-2020; a Annual average publication between 2016-2020; b Annual average citation between 2016-2020; c Average per year national income (GDP) between 2016-2020; d Annual average of publications per 1 million population between 2016-2020; e Annual average of citations per publication between 2016-2020; f The value obtained by dividing the average number of publications by the average per capita national income between 2016-2020; g Annual average of the number of publications per million population between 2016-2020, and the value obtained by the number of citations per publication.

Table 4. List of Muslim world universities in the Top-400 of the Times Higher Education World University Rankings 2019/2020.

Ranking in the World	University	Country
201-250	King Abdulaziz University	Saudi Arabia
201-250	Alfaisal University	Saudi Arabia
301 - 350	University of Malaya	Malaysia
301 - 350	United Arab Emirates University	United Arab Emirates
351–400	Khalifa University	United Arab Emirates
351–400	Jordan University of Science and Technology	Jordan
351–400	Sabancı University*	Turkey
351–400	Babol Noshirvani University of Technology	Iran

* Times Higher Education World University Rankings 2019.

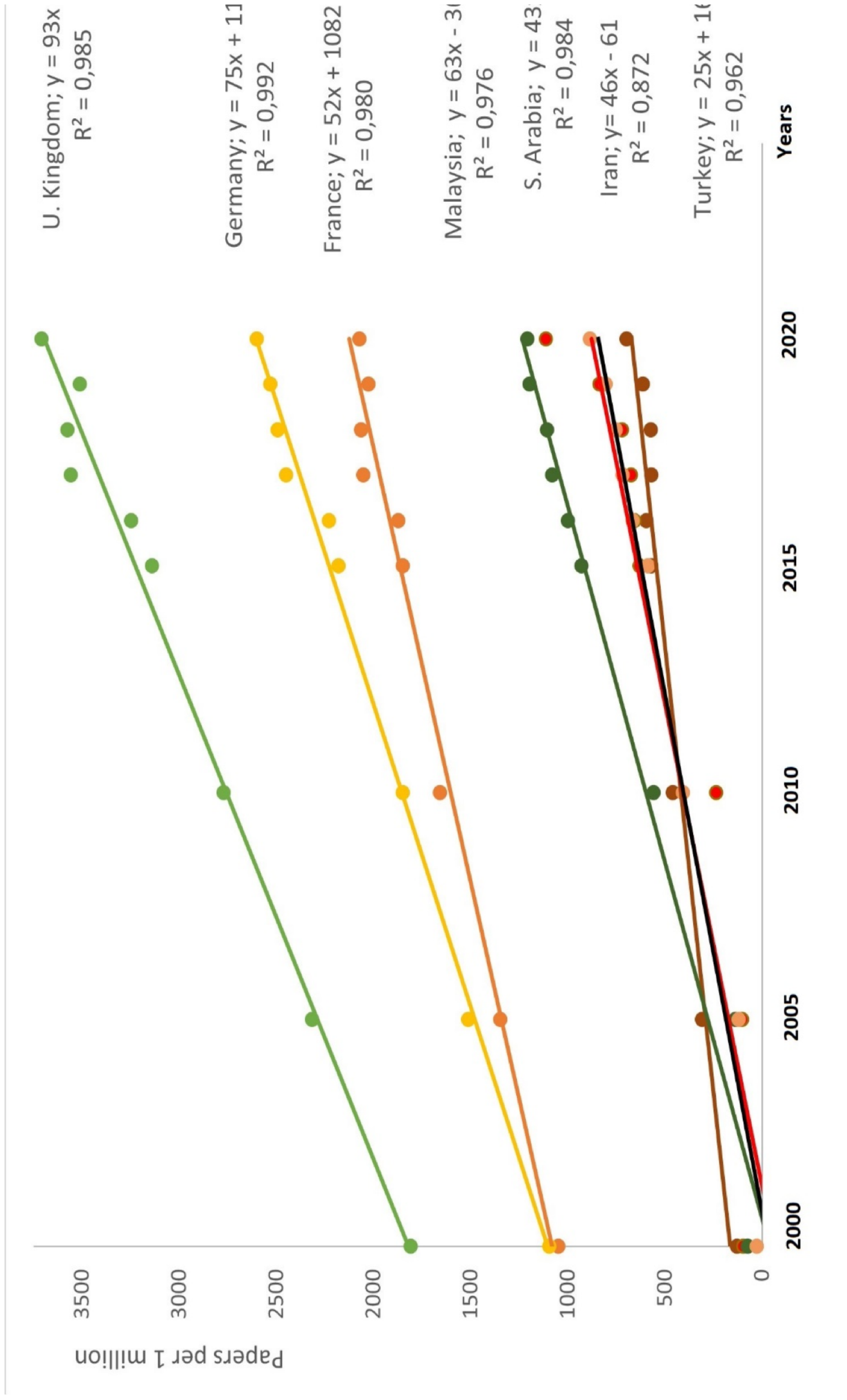

Figure 1. Distribution of publications per million population, gradient line and gradient equations of countries in 2000-2020.

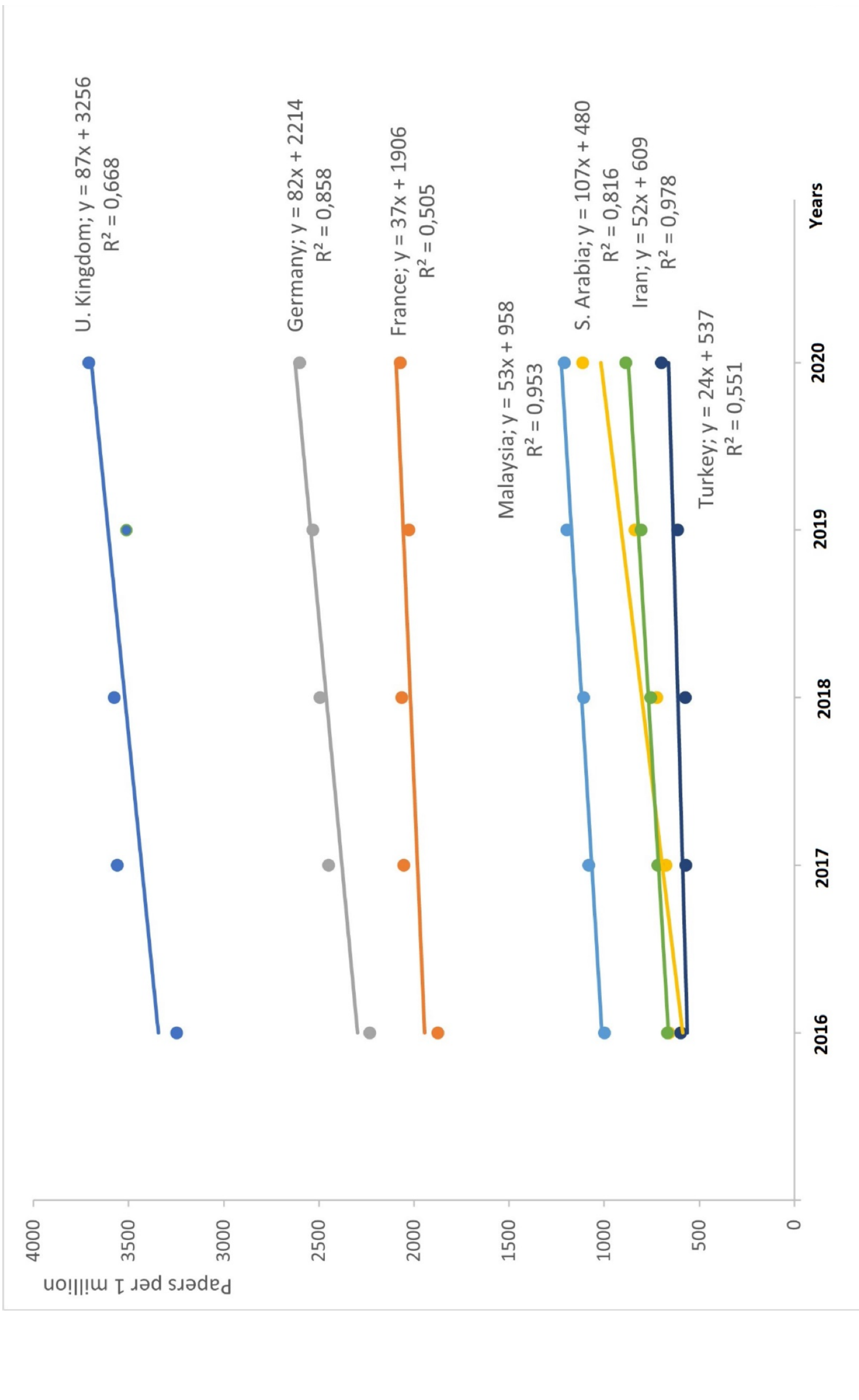

Figure2.Distribution of the number of publications per million population, gradient line, and gradient equations of the countries in 2016-2020.