

Millennial students' perception on the integration of Islam and science in Islamic universities

by Rizkia Suciati

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Rizkia Suciati

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Universitas Negeri Malang, Indonesia

Universitas Muhammadiyah Prof. DR. HAMKA Jakarta, Indonesia

E-mail: rizkia_suciati@uhamka.ac.id

Herawati Susilo

Universitas Negeri Malang, Indonesia

E-mail: herawati.susilo.fmipa@um.ac.id

Abdul Gofur

10

Universitas Negeri Malang, Indonesia

E-mail: abdul.gofur.fmipa@um.ac.id

Umie Lestari

10

Universitas Negeri Malang, Indonesia

E-mail: umie.lestari.fmipa@um.ac.id

Izza Rohman

Universitas Muhammadiyah Prof. DR. HAMKA Jakarta, Indonesia

E-mail: izza.rohman@uhamka.ac.id

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Abstract

This study describes students' perception of the concept of the integration of Islam and science. The integration of religious knowledge into science learning means the elimination of the paradigm of separating science and religion. This is important because many students do not understand how to connect the scientific theories studied to their own religious beliefs. This research surveys 175 students from 4 Islamic universities in Indonesia. The respondents filled an online questionnaire containing 8 two-tiered questions based on 7 conceptual understanding indicators of the integration of Islam and science. The indicators measure students' understanding of: (1) Science; (2) The relationship between science and religion (Islam); (3) The effect of science on religion; (4) The influence of Islamic insights on science learning; (5) The role of religion in the development/advancement of science; (6) The conflict between science and religion; (7) The differences in scientific concepts developed by Muslim and non-Muslim scientists. The result shows that the students' perception on the relationship between Islam and science can be categorized as the perception of integration. They argue that religion has a role in the development of science, and science has a role in supporting the sustainability of life. The students also conceive that a lecturer's Islamic insight can have an influence on the learning process, especially in Biology course.

Penelitian ini mendeskripsikan persepsi mahasiswa tentang konsep integrasi Islam dan sains. Integrasi ilmu agama ke dalam pembelajaran sains bermakna menghilangkan paradigma pemisahan antara sains dengan agama. Hal ini penting karena masih banyak mahasiswa yang belum memahami bagaimana cara menghubungkan teori-teori sains yang telah dipelajari dengan keyakinan yang dimiliki. Penelitian ini menggunakan metode survei, melibatkan 175 mahasiswa dari 4 perguruan tinggi Islam di Indonesia. Responden mengisi kuesioner secara online yang berisi 8 pertanyaan berbentuk *two-tier* berdasarkan 7 indikator pemahaman konsep integrasi Islam dan sains. Indikator tersebut mengukur pemahaman mahasiswa tentang: (1) Sains; (2) Hubungan antara sains dan agama (Islam); (3) Pengaruh sains terhadap agama; (4) Pengaruh wawasan keislaman yang dimiliki terhadap pembelajaran sains; (5) Peran agama dalam perkembangan/kemajuan sains; (6) Konflik antara sains dengan agama; (7) Perbedaan konsep sains yang dikembangkan oleh ilmuwan muslim dan non-Muslim. Hasil penelitian

menunjukkan bahwa persepsi mahasiswa tentang integrasi Islam dan sains dapat dimaknai sebagai persepsi integrasi. Mereka berpendapat bahwa agama berperan dalam perkembangan sains, dan sains memiliki peran dalam keberlangsungan kehidupan. Mahasiswa juga berpendapat bahwa wawasan keislaman dari seorang dosen berpengaruh terhadap proses pembelajaran sains, khususnya mata kuliah Biologi.

Keywords: *Perception; Integrative approach; Islamic university; Science*

Introduction

13 Modernization refers to a model of a progressive transition from a 'pre-modern' or 'traditional' to a 'modern' society, and this has led to rapid changes in the development of science and technology. However, religion seems to evolve slowly in such a way that there is often a disagreement between religion, science and technology.¹ In retrospect, the conflict between religion and science arises because religious views and doctrines are contrary to modern scientific theory, such as the case of the church execution of Galileo in the 19th century and the long dispute between the proponents of the theory of evolution and creation.²

In the scientific history of Muslims, a distinction has been made between the terms "Islamic studies" and "non-Islamic studies" in the relationship between religion and science for decades. This has even spread as a form of dichotomy, especially in the field of education. There is a gap between the characteristics of religious (under the auspices of the Ministry of Religious Affairs) and public schools under the Ministry of Education and Culture.³ Even though education is important because it is dynamic

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¹Baso Hasyim, "Islam Dan Ilmu Pengetahuan (Pengaruh Temuan Sains Terhadap Perubahan Islam)", *Jurnal Dakwah Tabligh*, Volume 14, Number 1 (2013), 127-139.

²Rabiatul Adawiyah, "Integrasi Sains dan Agama dalam Pembelajaran Kurikulum PAI (Perspektif Islam dan Barat serta Implementasinya)", *Al Banjari*, Volume 15, Number 1 (2016), 99-123.

³Syamsul Kurniawan, "Perspektif Umat Islam Tentang Agama dan Ilmu Pengetahuan",

and able to encourage an individual to become a better person, some Muslim scholars strongly recommend an Integrated Education System.⁴

The dichotomy of religion and science in the field of education is known when the curriculum and materials applied in Indonesia have not instilled spiritual values. This is evident in students at Elementary School, Junior High School, and Senior High School/Vocational High School that emphasize only intellectual improvisation and limit religious knowledge to *madrasah* or pesantren institutions.⁵ Not only in Indonesia, but also reported in Malaysia in 2011, it is known that science and religion learning are taught separately, and therefore making it separate research.⁶ Actually, Islam does not recognize the dichotomy of religious knowledge (knowledge of *Naqli*) and non-religious knowledge (knowledge of *Aqli*). The perception that creates this dichotomy prevents Muslims from advancing science and technology, and there has been a contradiction in the relationship between religion and science.⁷ Basically, science and religion are compatible. Religion asks each of its followers to continue learning because science can be proven through religion; therefore, there is an integrated relationship between science and religion that does not need

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Dinamika Penelitian: Media Komunikasi Penelitian Sosial Keagamaan, Volume 19, Number 1 (2019), 145-166.

⁴Maimun Aqsha Lubis, "Effective Implementation of The Integrated Islamic Education", *Global Journal Al Taqafah*, Volume 5, Number 1 (2015), 59-68.

⁵Novianti Muspiroh, "Integrasi Nilai-Nilai Islam dalam Pembelajaran IPA di Sekolah", *Jurnal Pendidikan Islam*, Volume 28, Number 3 (2013), 168-188.

⁶Khalijah Mohd Salleh et. al., "Teachers' Concerns, Perception and Acceptance toward Tauhidic Science Education", *Kyoto Bulletin of Islamic Area Studies*, Volume 4, Issue 1 & 2 (2011), 124-155.

⁴²Jamal Fakhri, "Sains dan Teknologi dalam Al-Qur'an dan Implikasinya dalam Pembelajaran", *Ta'dib*, Volume 15, Number 01 (2010), 121-142. there are four of science principles in Qur'an. Among of them are: istikhlaf, equilibrium, and taskhir principles. The concept of science and technology in Qur'an is also applicable and relevant to be applicated in learning process at Islamic education institution. But, there is still a problem in it, i.e. the problem of educational dichotomy. The problem can be solved by integration project in education. It can be elaborated in three issues: 1

to be debated.^{8,9} Hidayat (2015) explains that Islam and science are one unit, which means that even without being integrated, they are actually integrated. If there is a separation between the two, it is the result of a misunderstanding of the universal teachings of Islam (*Kaffah*).¹⁰

The integration of science and Islam aims to restore the glory of Islam during the times of Islamic scholars in the past.¹¹ This integration exists because of the dichotomy between religion (Islam) and science. The model of unity between Islam and science tends to be a model of connection with the areas of integrative interdependence, integrative complementarity, and qualitative integration.¹² Science and religion can relate to each other in four different ways, one of which is through integration. Therefore, understanding the difference between the two is very important to know their interaction more deeply.¹³ In Islam, connecting religion with science have a personal impact on individual beliefs, and integrating religion with science is beneficial for both the world and afterlife.¹⁴ Therefore, the dichotomy between science and religion should be eliminated, and education is one of the best media for this purpose. With an integrative paradigm in the scientific context between transmitted and acquired knowledge, it is expected that a holistic and non-partial academic

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⁸Nasser Mansour, "Religious Beliefs : A Hidden Variable in the Performance of Science Teachers in the Classroom", *European Education Research Journal*, Volume 7, Number 4 (2008), 557-576.

⁹Nasser Mansour, "Science Teachers' views of Science and Religion vs the Islamic Perspective : Conflicting or Compatible?", *Science Education*, Volume 95, Issue 2 (2010), 281-309.

¹⁰Fahri Hidayat, "Pengembangan Paradigma Integrasi Ilmu: Harmonisasi Islam dan Sains dalam Pendidikan", *Jurnal Pendidikan Islam*, Volume 4, Number 2 (2015), 299.

¹¹E.B. Minarno, "Integrasi Sains-Islam dan Implementasinya", *Seminar Nasional Teknologi Informasi, Komunikasi, dan Industri*, Pekanbaru 18-19 Mei 2017, UIN Sultan Syarif Kasim Riau.

¹²Fathul Mufid, "Islamic Sciences Integration", *QIIS (Qudus International Journal of Islamic Studies)*, Volume 2, Number 2 (2014), 144-160.

¹³Nidhal Guessoum, "Science, Religion, and the Quest for Knowledge and Truth: An Islamic Perspective", *Cultural Studies of Science Education*, Volume 5, Number 1 (2010), 55-69.

¹⁴Khalijah Mohd Salleh et. al., "Teachers' Concerns..."

atmosphere can be created.¹⁵

In education, the science and Islam integration requires the role of the curriculum developers; they should ensure the integration of every subject matter.¹⁶ Science teachers as one of the curriculum developers need to have the view that science is a “body of knowledge;” therefore science and religion should be in line with beliefs.^{17,18} Likewise, at the university level, Islamic science learning needs to involve lecturers and students in integrating their teaching and learning experiences.¹⁹ The science curriculum must provide a vision that proves that there are no contradictions between science and religion. Integrating Islamic values into science learning illustrated that science is part of God’s creation.^{20,21} The success of integrating Islamic values into science learning is significantly determined by the teacher’s background and Islamic knowledge.²² Integrating Islamic values into science education requires choosing an effective approach, strategy or method in the learning process.²³ If this integration process is carried out carefully, the process of internalizing Islamic values among students

¹⁵Iis Arifudin, “Integrasi Sains dan Agama serta Implikasinya Terhadap Pendidikan Islam”, *Edukasia Islamika*, Volume 1, Number 1 (2016), 161–180.

¹⁶Anda Juanda, “Profesionalisme Mahasiswa Biologi Mengintegrasikan Pelajaran Biologi dengan Agama Islam”, *Scientiae Educatia*, Volume 5, Number 1 (2015), 1–12.

¹⁷Abdullateef H. Haidar, “Emirates Secondary School Science Teachers’ Perspectives on the Nexus between Modern Science and Arab Culture”, *International Journal of Science Education*, Volume 24, Number 6 (2002), 611–626.

¹⁸Nasser Mansour, “The Experiences and Personal Religious Beliefs of Egyptian Science Teachers as a Framework for Understanding the Shaping and Reshaping of Their Beliefs and Practices about Science-Technology-Society (STS)”, *International Journal of Science Education*, Volume 30, Number 12 (2008), 1605–1634.

¹⁹K.P. Seng, “Bridging science and religion in China: Emerging opportunities for global dialogue”, *Theology and Science*, Volume 4, Number 2 (2006), 183-192.

²⁰Mansour, “Religious Beliefs”...

²¹Mansour, “The Experiences and Personal Religious Beliefs”...

²²Hidayat, S. *Integrating the Islamic Values in Science Learning (IPA) in Elementary School (Descriptive-Qualitative Research in Elementary School Al Muttaqin Full Day School) Tasikmalaya*, Bandung: Universitas Pendidikan Indonesia, Thesis, 2009.

²³Maimun Aqsha Lubis, “Effective Implementation...”

becomes easier because they are aware of the process.²⁴ Therefore, Islam and science integration should be balanced and compatible with practical benefits. Therefore, the process of integration of Islam and science should be a buffer and practice of these Islamic values.²⁵

The existence of perception is very important in the acquisition of knowledge. Furthermore, an individual knowledge can provide an interpretation of an object that is observed, and therefore it produces an assessment or response. The perceptions of teachers or college students will certainly influence their learning process by integrating science with Islamic values.²⁶ Several studies related to the perception of the relationship between religion and science is important because there are many students that do not understand how to relate scientific theories studied with their beliefs (religion), and this may be the cause of the religious separation from science.²⁷ Judging from several studies related to the integration of Islam and the concept of science, perception is important to reveal what is in one's thinking regarding the concept. Therefore, the science students' perception, especially Biology students, is important to know the scope of their knowledge on the integration of Islam and science before learning the concept. The results are certainly beneficial for internal stakeholders (research programs and faculties) to develop strategic plans in an effort to implement biology courses that are integrated with Islamic values.

In this study, the respondents involved were 175 students consist of 19

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²⁴Nining Purwati and others, "Increasing Islamic Junior High School Students Learning Outcomes through Integration of Science Learning and Islamic Values", *International Journal of Instruction*, Volume 11, Number 4 (2018), 841-854.

²⁵Hayat Hayat, "Integrasi Agama dan Sains Melalui Mata Kuliah PAI di Perguruan Tinggi", *INSANIA : Jurnal Pemikiran Alternatif Kependidikan*, Volume 19, Number 2 (2014), 254-272.

²⁶Hanik Fitrianasari, "Teachers' Perception of Inclusive Education Management According to Educational Background in Blitar Regency", *Jurnal Pendidikan Khusus*, Volume 7, Number 2 (2015), 1-5.

²⁷D. H. Ebenshade, "Student Perceptions about Science & Religion", *The American Biology Teacher*, Volume 55, Issue 6 (1993), 334-338.

males and 156 females. The students were 2nd, 4th, and 6th semester biology majors from 4 Islamic universities consisting of Universitas Muhammadiyah Prof. DR. HAMKA (UHAMKA) totaling 106, Universitas Muhammadiyah Malang (UMM) with 46, Universitas Muhammadiyah Surakarta (UMS) with 12, and Universitas Islam Negeri Syarif Hidayatullah Jakarta (UIN Jakarta) with 11 respondents. The respondents were given an online Google Form questionnaire that contained with 8 *two-tier* questions, and adapted from Mansour's (2010) questionnaire²⁸ and developed as required, considered by condition and number of samples. The questionnaire was on: (1) the understanding of science; (2) the relationship between science and religion (Islam); (3) the influence of science on religion; (4) belief in Islamic insights related to science learning; (5) the religion role in the development/advancement of science; (6) the views related to the conflict between science and religion; and (7) the views related to differences in scientific concepts developed by Muslim and non-Muslim scientists. More details can be seen in the Appendix.

Based on the result of data analysis, the respondents were given different answers and reasons for each question topic. This is in line with the explanation offered by Mansour (2008), which categorized the relationship between science and religion into four including conflict, independence, dialogue, and integration. The following are findings and discussion which is related to the perception on the integration of Islam and science.

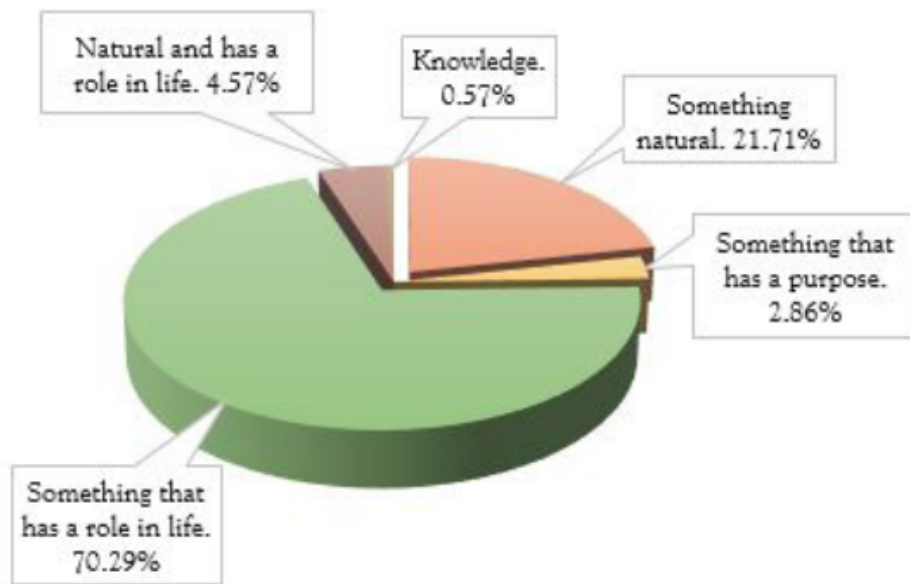
Perception about science

Scientific understanding is the first question asked by respondents and aims to determine the students' understanding of science. Knowing that biology is part of science, understanding is a fundamental question. The question *What is your opinion on science?* came with mixed answers. Out of

²⁸Nasser Mansour, "Science Teachers' views of Science..."

the four available answer choices, 70.29% chose the answer that science is *something that has a role in life*. The Fig. 1 illustrates the respondents' answers regarding their understanding of science.

Fig. 1. Percentage of respondents' answer about perception of science



According to Fig. 1, we can see that respondents choose the answer that science matters because they think that science plays a role in all aspects of life. This is in line with the opinion of the following respondents. FA²⁹ respondents states, "Science is an exact knowledge where each element has its own function and it is connected to one another. For example, each element of life plays a role in channeling energy". Meanwhile, IS³⁰ states that "This is because in science we know more about the environment, materials around us and we can find out about the plants and animals that exist on this earth". Based on the reasons of the respondent's, it is known that respondents that are students of Biology education understand that science is not just a product produced

²⁹FA, Interview, (18 May 2019)

³⁰IS, Interview, (2 March 2019)

through a process or something natural. However, they understand that science has a role in life because it also supports the survival of life.

Students' perception in understanding the meaning of science is certainly based on their ³⁸ understanding of its nature, namely science is a product and a process. ²⁶ Understanding the nature of science is one of the things that affect the learning process, although science learning in Indonesia is dominated by a learning process that tends to convey science concepts or products.³¹ When the concept is described as knowledge, it unconsciously forms a social construct built by their former educator (teacher or lecture) that makes absolute statements about science, which becomes an ontological statement. Therefore, it is undeniable that some respondents choose the answer that science is *knowledge* (0.57%), and science is *something natural* (21.71%) as shown in Fig. 1.

²⁶ Perception of the relationship between science and religion (Islam)

Furthermore, ²⁶ the students' perception ¹ of the relationship between science and religion shows that the two have a relationship in the form of *integration, support each other*, which is evident from 85.14% of respondents that chose this answer. Meanwhile, 9.14% chose the answer *independent, not related to each other*. Most of the respondents have the perception ¹ that the relationship between science and religion can take the form of integration. Previous research studies by Mansour (2008) supports the findings of this study that science and religion (Islam) can form four categories of relationships, such as conflict, independence, dialogue, and integration.³² An interesting reason from one of the respondents, EN³³ argue that "Science and Islam are fields that have different perspectives in dealing with today's life. However, despite these differences, there is a very powerful reciprocal relationship if

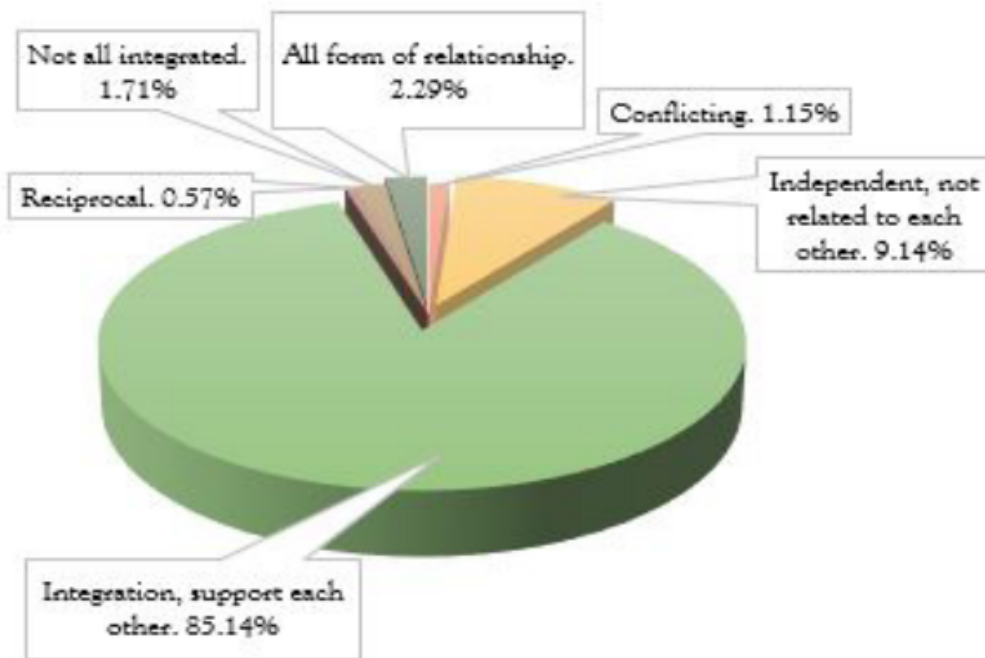
³¹Wati Oviana, "Pemahaman Hakekat Sains dan Aplikasinya dalam Proses Pembelajaran Sains", *Prosiding Seminar Nasional Biotik*, Volume 2, Number 1 (2015), 485-490.

³²Mansour, "Religious Beliefs..."

³³EN, Interview (7 July 2019)

science and Islam are integrated with a good pattern “. This opinion is reinforced by other respondents, which stated that science and religion can support each other. SA³⁴ expresses that “Science and religion support each other because they are written and are in the Qur’an, which includes human life and nature”. As stated by LK³⁵ respondents, “This is because in this case, science needs religion. Religious knowledge such as understanding of Qur’an verses or Hadiths can support the theories of scientists”. The diagram below (Fig.2) shows the comparison in the respondents’ answers.

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Fig. 2. Percentage of respondents’ answer about relationship between science and religion



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Regarding to respondents’ answer, which states that the relationship between science and religion is an integration, Mansour (2008) states that

³⁴SA, Interview, (23 July 2019)

³⁵LK, Interview, (20 July 2019)

science and religion are basically compatible³⁶. In religion (Islam), science can be proven through religion, which is believed to form an integrated relationship and does not need to be debated. In line with that opinion, one of the respondents pointed out the reason why science and religion are characterized by integration. AA³⁷ argues that *“This is because science proves the truth of the Qur’an that it is Allah that gives life. Allah created plants and animals to fulfill the needs of human and plant life. Furthermore, animals and humans are very much connected in life and that is the power of Allah SWT”*. This was also conveyed by DK³⁸, who stated *“All things whether scientific or not have been explained in the Muslim guidebook, namely the Qur’an, and therefore the two are related to each other”*.

As previously explained by Mansour (2008), **the relationship between science and religion is also understood as an independent form³⁹, and only 9.14% of respondents understand and answered according to the perspective.** Barbour in Mansour (2008) states that **science and religion can be distinguished according to the questions asked, the referred domain, and the used methods.** Therefore, some respondents think **that science and religion (Islam) are independent forms.** MH⁴⁰ argue that *“When talking about perception, it is clear that both of them are independent. This is because many scientists are atheists, which causes the science that is currently developing in accordance with reality. Meanwhile, when reflecting on Islamic scientists, long before foreign scientists expressed their opinion, they had already discovered it. Science should be integrated into Islam”*. Another reason explained by SyA⁴¹ is that *“there is no relationship between the two or independent. This is because*

³⁶Mansour, “Religious Beliefs...”

³⁷AA, Interview, (20 July 2019)

³⁸DK, Interview, (17 May 2019)

³⁹Mansour, “Religious Beliefs...”

⁴⁰MH, Interview (10 August 2019)

⁴¹SyA, Interview, (10 March 2019)

science is related to nature while religion is about the believe adhered to by every human being. Although they could support each other”.

These respondents initially thought that science and religion were independent, but the reasons in the last sentence indicated that science and religion should be in the form of integration. Mansour (2008) conveys studies that the view that science and religion are two independent realms, which does not correspond to the epistemology of Islamic knowledge. This is because in the history of Islamic science there are three sources for obtaining knowledge, namely reason, experience, and evidence of transmission from valid sources. Therefore, the opinion that the relationship between science and religion is an independent form is misconception.

Perception of the effect of science on religion

When asked the question *In your view, can science affect your religion beliefs (Islamic values)?* students argue that science can influence religion (Islamic values) and some choose that science does not affect religion (48%). Some chooses the answers *sometimes* (2.29%) and *maybe* (4%). This findings show that they argue that if science might affect religion, and in a special context sometimes science can affect religion. Fig. 3 shows the comparison of the results of the respondents' answers. Another finding is when respondents were asked questions related to the previous question, *“In what ways has science affected religion (Islamic values)?”* some argue that science affects religion in the context of the concept of science itself (48.57%), the way science is conveyed (40%), or even both. The diagram below shows a comparison (Fig. 4).

Fig. 3. Percentage of respondents' answer about science can affect religion (Islamic values)

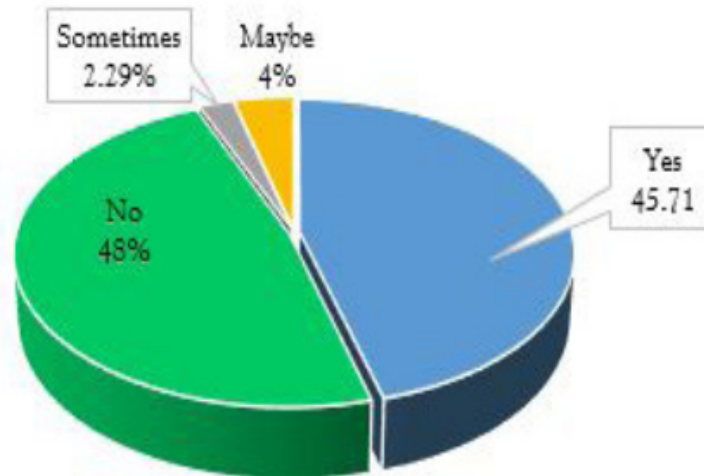
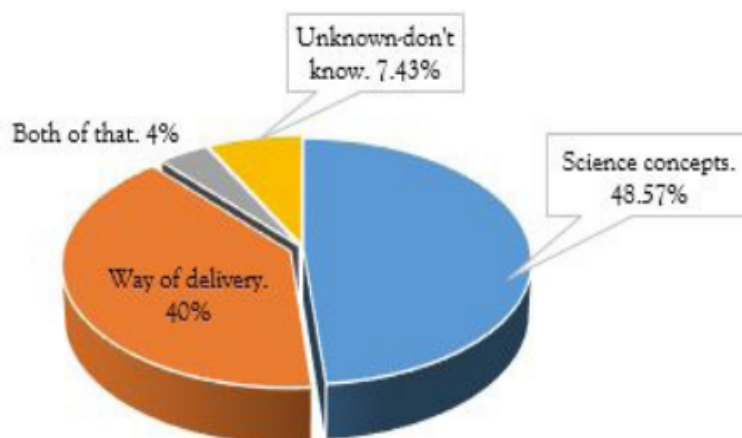


Fig. 4. Percentage of respondents' answer about the way science affected religion



Based on Fig.3 and Fig 4 above, we can see that some of the students choose the answer that science can affect religion and there are various ways when science affected religion. DW⁴² participants has a reason

⁴²DW, Interview, (23 July 2019)

that “In science concepts, concepts are often found that are contrary to Islamic religious values, therefore the concept of science is the main thing that influences Islamic values”. For reasons like that, they understand that science can affect religion through concepts in science itself then it will affect Islamic values in their lives. Not only that, some of the respondents also answered that science influences religion through the way it is delivered. MQ⁴³ respondent conveys that “Everyone has a different understanding. So science will affect the value of Islam if the way of delivering and delivering the information has a positive or negative impact on Islam. So for the layman who has an understanding of Islam is still less easily influenced. It is even possible to leave Islam, because negative science will affect the faith”. It also added by MM⁴⁴, “If the method of explanation is not good, it will be misconception and assuming that biology is contrary to Islam”.

Their reasons related to science affected religion or vice versa, of course based on their understanding of science itself, and their perspective on the relationship between science and religion. Science and religion are two areas of human knowledge that differ in terms of epistemology. The development of science emphasizes rational and empirical knowledge, while religion is intuitive knowledge. That understanding created a relationship between the two, John Hedley Brooke in Syarif (2014) revealed that the relationship between science and religion can be in the form of conflict or in the form of harmony-complementary.⁴⁵

However, there are also those students who still think that science cannot affect religion, because religion should influence science. This is the following statements of AS⁴⁶ respondent, which states that “Islam is faith, then science is

⁴³MQ, Interview, (10 March 2019)

⁴⁴MM, Interview, (17 May 2019)

⁴⁵Edwin Syarif, “Pergulatan Sains dan Agama”, *Refleksi*, Volume 13, Number 5 (2014), 641-654.

⁴⁶AS, Interview, (20 July 2019)

flexible knowledge". It also conveys another reason by UF⁴⁷, "Religion (or Islamic values) is a basic guideline in the development of science in which it can be clarified more deeply by studying science. The concept of science may not be the same or always change, so religion (Islam) will not be affected by the existence of science. Because it relates to the contents of the Qur'an as a guide for human life, it has been clearly explained and will not change until the end of the world".

Based on the opinion of respondents regarding the effect of science on religion, it can be seen that science affects one's religion. Islamic values and the character of a person's life can be influenced by the way he thinks about science. A study with the subject of science teachers in the United Arab Emirates (UAE) views science as a body of knowledge, science exploring the unknown. Science is the process of discovering new things, science is defined as rational understanding of reality, finding and using knowledge. Therefore, it is important to realize that science must go hand in hand with belief in order to realize a humble human being (admiring the greatness of Allah), and having a scientific and broad way of thinking.⁴⁸

Perception of the influence of Islamic insights on science learning

The next question was *Does someone's Islamic insight influence the way of teaching science (especially Biology)?*, about 78.86% of students chose the answer that a lecturer's Islamic insight would affect the integrated way of teaching science, especially biology. The rest chose the answer that an individual Islamic insight does not affect the way of teaching science content, and may affect the way of teaching but not entirely (see on Fig. 5).

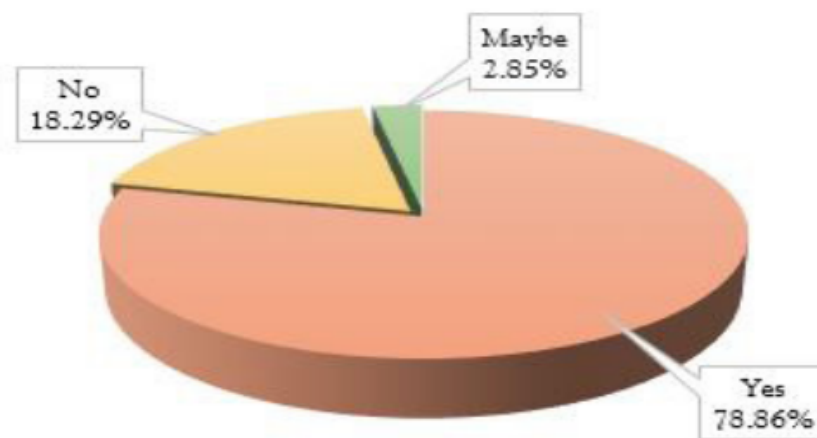
According Fig 5 below, a person's Islamic insight (in this case a teacher or lecturer) affects the integrated way of teaching science. This is because a person's insight into Islam will better relate the concept of science

⁴⁷UF, Interview, (18 May 2019)

⁴⁸Abdullateef H. Haidar, "Emirates Secondary School Science..."

with religion or Islamic values. They also argue that when an individual understands religion and explains the concept of science properly, it creates a deep sense of gratitude and belief in Allah SWT. This is the following argument from SM⁴⁹ respondent, “When we have good religious’ knowledge, then know how science is obtained, and finally know and get the knowledge, we know how Allah’s creation existed and do not forget to be grateful for what happened and what was in process”. NA⁵⁰ also conveys another reason that “Teachers or lecturers that have Islamic insight will teach biology properly and invite students to admire and be grateful for Allah’s creation. Therefore, they not only have good academic learning outcomes but also have good behavior and attitudes”.

Fig. 5. Percentage of respondents’ answer about someone’ Islamic insight influence the way of teaching science



However, not all respondents think that an individual insight affects the way of teaching. This can be seen from several respondents that chose the answer “No”. They reasoned that science and religion were two different realms, and therefore an individual Islamic insight would not affect the

⁴⁹SM, Interview, (9 July 2019)

⁵⁰NA, Interview, (3 March 2019)

way of teaching, especially science. They also argue that not all components from science are related to Islam, and a teacher or lecturer only needs to learn to increase his/her Islamic insight. EP⁵¹ has a reason that “Everyone has advantages and disadvantages. However, everyone will only need to learn and add insight into their knowledge”. Furthermore, some respondents also think both. This means that an individual Islamic insight might influence the integrated way of teaching science. This is very much in accordance with the reasons explained by YN⁵² respondents, “If someone teaches science that are associated with Islamic values, he will get a positive value. He certainly can teach Islamic values, and therefore there will be a sense of gratitude and belief in Allah SWT. However, if a person’s Islamic insight is limited, the Islamic values are certainly not maximally fulfilled in the science learning because it is only a concept and contextual without any religious elements”.

Therefore, the Islamic insight possessed by a teacher or lecturer is very important. The person’s Islamic insight influences the way of teaching, therefore science and religion (Islamic values) will support each other. This is in line with Salleh et al., (2011), which state that connecting religion with science will have a personal impact on the individual’s beliefs and integrating religion with science is beneficial for life in the world and the hereafter.⁵³ The perception of biology students acquiring the concept of Islam and the integration of science enables the students to develop an understanding that science and religion can work hand in hand without discussing conflict or contradiction. Therefore, the scientific learning integrated with religion (Islam) should be planned, starting from the curriculum to the implementation of the integration concept. Referring to the statement of Mansour (2008), education (curriculum) and science

⁵¹EP, Interview, (18 May 2019)

⁵²YN, Interview, (13 May 2019)

⁵³Salleh and others.

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teachers around the world should know that a person's religiosity has a positive or negative impact on the entire educational process.⁵⁴ In line with this, Nyhof-Young (2000) argues that an educator has an important role in efforts to develop and adjust the curriculum with the knowledge, priorities, and teaching context that is also adapted to religion in the case of Islam (Islamic values).⁵⁵

4 Perception of the role of religion in the development of science

The next question was *If science is developing or advancing, does religion play a role in that?*, about 83.43% of respondents answered that religion plays a role in the development or advancement of science. Meanwhile, only 14.29% chose the answer that religion has no role in the development or advancement of science. Regarding the role of religion in the development or advancement of science, they argue that religion certainly has a role to play in the development or advancement of science. This is because some Muslim and non-Muslim scientists have conducted experiments through various scientific methods on what is in their religious books. Another reason is that studying is an obligation, and many proverbs say it. The development or advancement of science is a demand for humans to always unravel the mysteries in the world. This was reinforced by the result of the NT⁵⁶ respondent interview, *"In religion (Islam), there is an order to study, and it is mandatory. Therefore, it becomes one of the factors driving the emergence of new discoveries or advances in the field of science"*. PD⁵⁷ also argue that *"Science and religion need to create an awareness that emerges through more harmonious, holistic, and comprehensive perception. The role of religion and education is one*

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⁵⁴Mansour, "The Experiences and Personal Religious Beliefs..."

⁵⁵J. Nyhof-Young, "Education for The Heart and Mind: Feminist Pedagogy and The Religion and Science Curriculum", *Zygon*, Volume 35, Number 2 (2000), 441-452.

⁵⁶NT, Interview, (20 July 2019)

⁵⁷PD, Interview, (18 May 2019)

of the best means to achieve the goals of life to make progress in the field of science not beyond religious principles". Meanwhile, some respondents argued that religion does not have a role play in the development or advancement of science because they have the reason that the development or advancement of science is not always related to religion. Religion is just a belief and science is a possibility proven through experiment, and therefore the two do not complement each other's roles. This was conveyed by GG⁵⁸ respondent, *"Religion is static or permanent. Meanwhile, science is the basis for proving what is in religious teachings. Science is always developing and needs proof, while religion is definitely right"*. YY⁵⁹ respondents also told that *"As science advances, it certainly affects all sectors of life, and therefore religion can be said to have no role in this. However, if the connection with religion wants to be proven, there is where religion play a role"*.

The explanation on the above reasons show that a serious interpretation of religion as a religious community (Islam) has an impact on life, namely the development or advancement of science. Religion has a role as a guide in an effort to reveal everything that exists in nature. Mansour (2008) states that Islam asks its adherents to continue to learn, to study what is in nature, and therefore science can be proven through it (religion).⁶⁰ This also includes the perception related to the concept of science developed by Muslim and non-Muslim scientists. Most of the respondents argue that there are differences in the concept of science between non-Muslim and Muslim scientists. They have a reason that non-Muslim scientists carry out research only to prove the truth of what is understood, without thinking about how religion or belief in God is there. Furthermore, prior to Renaissance, Western scientists tended to be atheists or even fanatical

⁵⁸GG, Interview, (18 May 2019)

⁵⁹YY, Interview (20) (6 March 2019)

⁶⁰Mansour, "The Experiences and Personal Religious Beliefs..."

about religion, which caused science to be considered a misleading belief.⁶¹

1 Perception of conflict between science and religion

Based on the respondents' answers regarding the question about the conflict-contradiction relationship between science and religion, some answered that science and religion clearly have this relationship. They argued that concepts of science are often viewed as contradicting religious principles and that science and religion are therefore often up for debate. This was reinforced by argue from WA⁶² respondents, which states "Some have a controversial relationship. The science associated with tissue culture, for example, often contradicts the theory of the creation of living things according to Islamic views. Whether this is true or not depends on how people react to it". KB⁶³ respondents also explained that "The contradicting relationship between science and religion can be seen from several scientific concepts related to the theory of creature of living things. For example, the Abiogenesis theory states that living things come from non-living things, while all of Allah's creation on earth is only Allah SWT that knows and by His will".

Meanwhile, some respondents argued that science and religion do not necessarily need to have a relationship in the form of conflict or contradiction because scientific concepts are the result of proof from what has been explained in religion through their respective books. Therefore, all things learned from science should be compatible with religion in order to aim for the good of mankind. This is in line with the research conducted by Purwanto (2015), which states that science and Islam actually have the aim of showing the unity of natural law, the relationship of all its parts and aspects as a reflection from the unity of divine principles. However,

⁶¹Edwin Syarif, "Pergulatan Sains dan Agama", *Refleksi*, Volume 13, Number 5 (2014), 641-654.

⁶²WA, Interview, (18 May 2019)

⁶³KB, Interview, (22 May 2019)

they have a conflict or conflicting relationship.⁶⁴ Barbour stated that there are two extreme groups of Science and Religion, therefore forming this (contradictory) conflict and interpreting science as materialism. Meanwhile literally (biblical literalism), science and religion lead to a person having to choose between the two.⁶⁵

8

Perception on differences in science concepts developed by Muslim and Non-Muslim Scientists

When the respondents were asked *Do you think there is any difference between the scientific concepts developed by non-Muslim (Western) scientists and Muslim scientists?*, they chose the answer “yes” (77.71%). According to respondents’ answer, there are differences in scientific concepts developed by non-Muslim (Western) and Muslim scientists. Most of the respondents argue that there are differences in the concept of science between non-Muslim and Muslim scientists. They have a reason that non-Muslim scientists carry out research only to prove the truth of what is understood, without thinking about the veracity of religion or belief in God. Furthermore, prior to Renaissance, Western scientists tended to be atheists or even fanatical about a religion, which caused science to be considered a misleading belief. This is also a reinforced reason by WA⁶⁶ respondent, which states “*There are differences in the concept of science between Western and Muslim scientists. Western scientists develop science without any basic religious foundations such as Qur’an and hadith. When they develop science, it is only a proof that they can make a new discovery. It is different from Muslim scientists that always associate it with the greatness of Allah*”.

On the other side, the respondents also choose there’s no differences

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⁶⁴Agus Purwanto, *Ayat-Ayat Semesta, Sisi Lain Al Qur’an yang Terlupakan*, Bandung: Penerbit Mizan, 2015, 188.

⁶⁵Mansour, “Religious Beliefs...”

⁶⁶WA, Interview, (18 May 2019)

in the concept of science developed between Western and non-Muslim but it differs in basic beliefs. Setiawan (2020) explained that Western scientists during the Renaissance period believed that human experience, experimentation, and rationality were the basis of this worldly life, and therefore humans became the center of the universe (anthropocentric). While, as God's creatures, humans should not feel greater.⁶⁷ RA⁶⁸ respondent was expresses that *"The difference in scientific concepts between Western and Muslim scientists is very clear. Although both develop the same concept of science, Western scientists do not really care about religion and therefore they tend to create secularist thoughts. Meanwhile, Muslim scientists always adhere to Aqidah (faith) that should not be violated"*.

Conclusion

This study shows that millennial students generally agree on the integration of Islam and science. It can be seen from their answers, which in general imply that religion (Islam) and science can be in harmony. Students perceive science as having a role in life sustainability, not merely as a product produced through a certain process or as something natural. In addition, students understand the relationship between science and religion more in a form of integration, where both can support each other. Religion can affect the process of, and reinforce, science given the fact that the Qur'an gives many hints of science, containing what is called *ayat Kauniyah* (verses related to universe). They also argue that religion has a role in the advancement of science, and that a lecturer's Islamic insight can affect the way of delivering science (Biology) in learning process.

Theoretically, this research implies that the relationship between science and religion has been perceived more as that of integration, rather than

⁶⁷Setiawan, S., "Renaissance: Latar Belakang, Sejarah, Sebab, Karakteristik, Tokoh", *Guru Pendidikan*, 28 Januari 2021, <https://www.gurupendidikan.co.id/renaissance/>

⁶⁸RA, Interview, (20 May 2019)

of conflict, independence, or dialogue. Practically, this conclusion implies the need for developing and implementing a curriculum that integrates Islam and science, for introducing the concept of integration of Islam and science to students in the learning process, and for providing and enriching materials on the integration of Islam and science through academic discussions and publications. Therefore, further studies can be expected to address curriculum structure, learning materials, public discourse, academic works (articles, modules, textbooks), and campus life relevant to the concept of integration of Islam and science. Thus, the concept of integration of Islam and science can have a far-reaching impact on Islamic universities and beyond.

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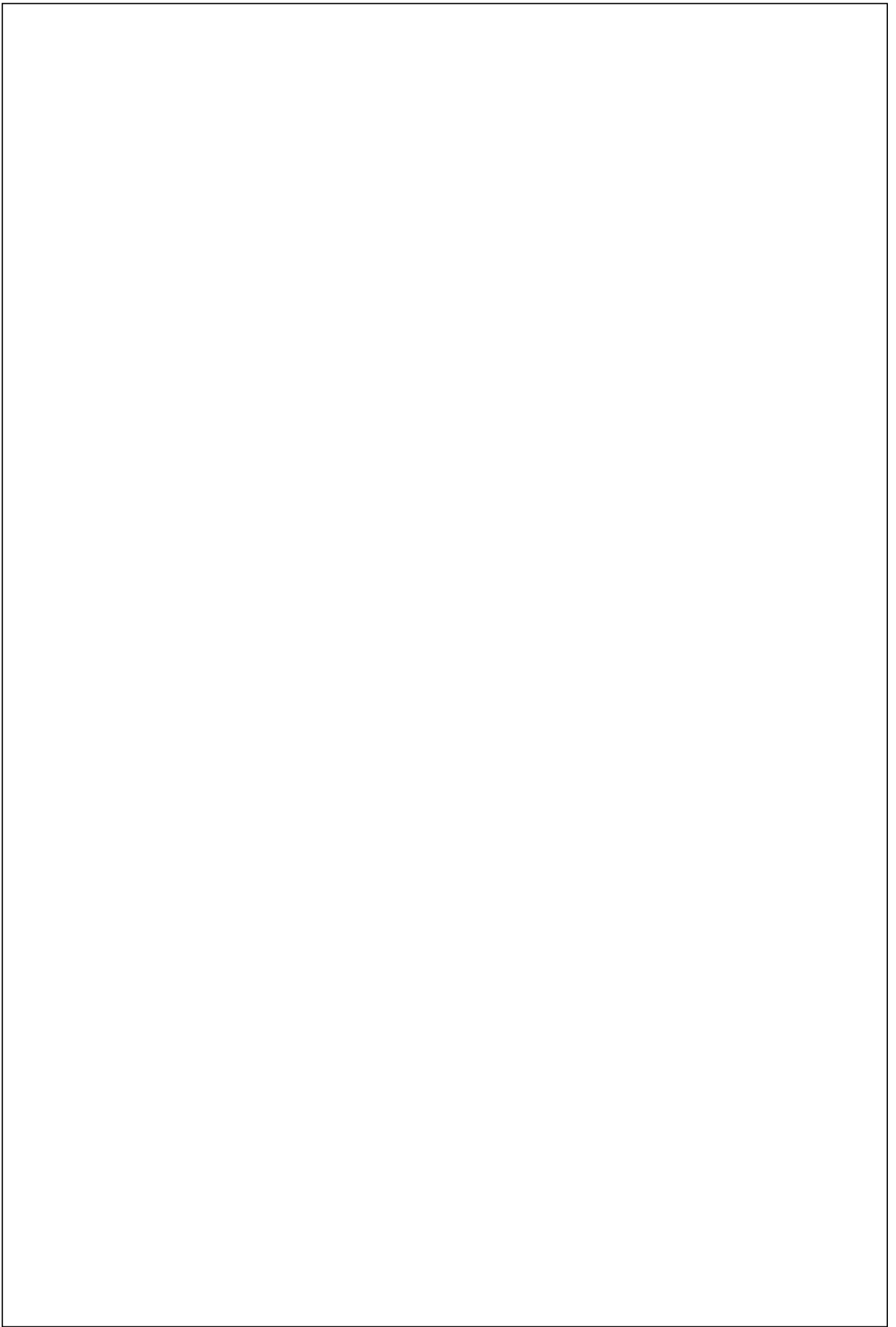
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