



A Cloning Issue of Human, Animal, and Plant in Science Teachers' Argumentation: A study in Islamic Organization-Based Schools

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Abstract. Cloning is a fascinating topic in the socio-scientific question. This is a contentious question in both religion and science. Science teachers must be able to deliver this topic proportionally in the practice of science learning in class. The purpose of this study is to investigate how science teachers in Islamic organization-based schools argue over human, animal, and plant cloning. This study was carried out at three Islamic organization-based schools. This study used the qualitative technique, with observations of learning about cloning in class, a questionnaire, and an in-depth interview with six science teachers from three different schools in Banten Province, Indonesia. The findings of the study reveal that the topic of human, animal, and plant cloning is not only coupled with a religious aspect; there are distinct argumentative patterns in the minds of teachers. As a result, more research is needed to investigate the effects of Islamic organizations on the arguments and practice of cloning issue teaching in Islamic organization-based schools.

Keywords: Argumentation, Cloning Issue, Islamic Organization

Introduction

Knowledge and religion are actually united. Learning knowledge will be in line with deepening faith and devotion. By learning this cloning topic, it should be based on religious study since knowledge and religion are basically the same, namely to explore God the Almighty, so it will end with an improvement in students' faith and devotion. Teachers, in practicing their learning, will not be separated from trust and belief in religious values. The focus of Islamic civilization is Islam itself, and the basic of Islamic teachings is Tawhid, or admitting that there is only one God as the Creator, any actions confirming that the God is One, the absolute and transcendent Creator, Ruler of all things [1], [2]. It means that a teacher must refer to Tawhid values, namely admitting that there is only one God. Thus, it is necessary for an Islamization of Science concept

that leans on tawhid strength [3]. This is suspected to have effects on teacher arguments about cloning. As revealed by [4], one scientific and religious way of thinking is central to an individual's cognitive and cultural understanding of the world. So did [5], [6] stated that the beliefs of educational practitioners in general and the beliefs of teachers in particular are not context-free. Therefore, it is necessary to examine the influence of teacher religious beliefs on their arguments about cloning. This research was conducted to answer the following questions: How do the science teachers' arguments about the cloning issues of humans, animals, and plants? Are the teachers' arguments influenced by their beliefs?

2 Methodology

In this work, a qualitative case study methodology is employed. This study examines the teachers' arguments for cloning at schools run by Islamic organizations. Six teachers from schools run by Islamic organizations participated in an in-depth interview and completed a questionnaire to provide the information. In order to triangulate the data, principals and students were interviewed. Six teachers from three Islamic organizations' affiliated schools in South Tangerang, Banten Province, Indonesia, are participants. The Nahdatul 'Ulama (NU), Integrated Islamic School Network (JSIT), and Muhammadiyah organizations are used as bases for the schools' purposeful sampling. Then, in order to maintain anonymity, the three schools were randomly assigned the codes A, B, and C.

3 Result and Discussion

3.1 Profile Claims Teacher's Arguments about Some Issues on Cloning Topics

The teacher's argumentation profile covers cloning topics with issues of; 1) cloning on plants for production 2) plant cloning for zakat 3) cloning on extinction animals 4) cloning of animals for sacrifice and 5) cloning at humans for therapeutic 6) and clothing for reproduction. The issue of cloning is raised to present a situation or problem that is causing conflict [7] on the subject of the cloning. Two teachers from each school in the Islamic organization give their arguments as shown in Table 1

Table 1. Claims Teacher's Arguments about Some Issues on Cloning Topics

Teachers' codes in schools on Islamic organizations	issues related to cloning topics	Cloning on plants for production	Cloning of plants to zakat	Cloning on extinction animals	Cloning in sacrificed animals	Human cloning for therapeutics	Human cloning for reproductive
Organization A							

Teachers' issues related to cloning topics						
codes in schools on Islamic organizations	Cloning on plants for production	Cloning of plants to zakat	Cloning on extinction animals	Cloning in sacrificed animals	Human cloning for therapeutics	Human cloning for reproductive
Teacher 1	agrees	Agree with conditions	agrees	agrees	agrees	disagree
Teacher 2	strongly agree	disagree	strongly agree	agrees	agrees	disagree
Organization B						
Teacher 3	strongly agree	Agree with conditions	strongly agree	agrees	agrees	disagree
Teacher 4	disagree	disagree	Agree with conditions	disagree	Agree with conditions	disagree
Organization C						
Teacher 5	agrees	Agree with conditions	disagree	disagree	Agree with conditions	disagree
Teacher 6	agrees	Agree with conditions	disagree	disagree	Agree with conditions	disagree

In Table 1. a shift from the teacher's argumentation for each issue related to the cloning topic from agreeing, agreeing on condition and disagreeing shown. In discussing these arguments look at the development of the teacher's arguments from the beginning to reaching conclusions related to the topic of cloning. According to [7] the argument is like an organism. It has a rough and more delicate anatomical structure, in carrying out its physiological functions. One can distinguish the main phases that mark the development of the argument from the initial statement of a problem to the end of a conclusion [7]. In the simplest form, the argument consists of the claims and the reasons that support it [7], [8] as well as the argumentation as a way to analyze the emphasis on the epistemological nature of science [9].

This situation requires teachers to be able to think deeper before expressing their opinions so that they can direct learning according to the curriculum framework and develop critical thinking patterns in the pupils. Because, in science education, argumentation is regarded as a core skill that can empower younger generations to science literacy, develop critical thinking, reasoning, communicative and metacognitive skills [10]–[13] So, arguing with teachers on controversial issues such as cloning with such provisions will affect students' views on the subject and learning situations in the classroom.

It is consistent with the view that argumentation is a discursive practice aimed at increasing (or decreasing) the acceptance of controversial perspectives [14]. Even

today, argumentation has been recognized as both a means and a goal of education [15][12][16]. As a result, initiatives in various countries have included argumentation as one of the main objectives of science teaching. Indonesia with a wide variety of social, religious, racial and cultural backgrounds that raise various perspectives and controversies in science learning will be increasingly interesting to study.

3.2 Profile of Reason in Teacher's Argumentation about Some Issues on Cloning Topics

In submitting the argumentation claims, the Teacher includes the reasoning in their arguments. The profile of the reason in the Teachers argumentation is found in Table 2.

Table 2. Reasons in Teacher's Argumentation about Some Issues on Cloning Topics

Teachers' codes in schools on Islamic organizations	issues related to cloning topics					
	Cloning on plants for production	Cloning of plants to zakat	Cloning on extinction animals	Cloning in sacrificed animals	Human cloning for therapeutics	Human cloning for reproductive
Organization A						
Teacher1	economy, environmental	religion, health	environmental	religion, economy	health, social & humanity	religion, social & humanity, health
Teacher 2	economy, social & humanity	religion, social & humanity	environmental	social & humanity, religion	health, social & humanity	religion, social & humanity
Organization B						
Teacher 3	social & humanity	religion, health	environmental	religion, social & humanity	health, social & humanity	religion, social & humanity
Teacher 4	health, environmental	religion, social & humanity, health	environmental, health	religion, health	health, social & humanity	religion, social & humanity
Organization C						
Teacher 5	economy, environmental	religion, health	health	religion, health	health, social & humanity	religion, social & humanity

Teachers' codes in schools on Islamic organizations	issues related to cloning topics					
	Cloning on plants for production	Cloning of plants to zakat	Cloning on ex-tinction animals	Cloning in sacrificed animals	Human cloning for therapeutics	Human cloning for reproductive
Teacher 6	economy, social & humanity	religion, health	health	religion, health	health, social & humanity	religion, social & humanity

From the analysis of the entire argument of the teacher against some issues on the topic of cloning put forward there are five categories of reasons presented by the teacher are factors: 1) religion 2) social & humanity 3) economics 4) health and 5) the environment. This finding is consistent with what is revealed [17] that in looking at the relationship between science and religion it turns out that the problems of philosophy, including ethics, are also considered in science. Then in this phase is also drawn cognitive processes in the mind of the teacher to evaluate and consider opinions or choices as presented by the previous experts [18]–[22] It means that when a person is confronted with a dilematic issue that is heavily related to religion or belief, then other values will also be considerations such as philosophy, science, social norms, ethics and morality [23] These moral considerations provide the basis for teachers to express their views in accordance with the view [24] that the problem of cloning has brought about a deep discussion related to ethics, social, and health. At the same time [25] states there is no single picture of morality in terms of cloning. Everyone has very different, and often contradictory, ideas about the moral nature of things. It is also explained that the decision-making process on socio-scientific issues in this case of cloning often involves the negotiation process on conflicts with science on claims, evaluating such claims and perceived risks based on evidence, and considering the advantages and disadvantages of alternative decisions from a variety of perspectives including ethical, environmental, and social [21]. Because religious values do not stand alone, other values also contribute in one's mind before making decisions about cloning, such as humanity and morality.

3.3 Thinking Orientation in Teacher's Argumentation

In terms of religious orientation, for the context related to religious values, this has become the orientation of the mind of the teacher, because the standpoint given is related to the religious value such as plant cloning for zakat, cloning animals for sacrifice and cloning humans for therapeutic and reproductive. For example, in the case of human reproductive cloning, the teacher at the school of the organization A explicitly expressed his disagreement on the basis of a sign in the Qur'an, including QS Al Hajj: 5, which means:

"O People, if you should be in doubt about the Resurrection, then [consider that] indeed, We created you from dust, then from a sperm-drop, then from a clinging clot, and then from a lump of flesh, formed and unformed – that We may show you. And We settle in the wombs whom We will for a specified term,

then We bring you out as a child, and then [We develop you] that you may reach your [time of] maturity. And among you is he who is taken in [early] death, and among you is he who is returned to the most decrepit [old] age so that he knows, after [once having] knowledge, nothing. And you see the earth barren, but when We send down upon it rain, it quivers and swells and grows [something] of every beautiful kind." [27].

Then added with Surah An Najm: 45-46 which means:

"And that He creates the two mates – the male and female – From a sperm-drop when it is emitted " [27].

By quoting some of the verses of the Quran, the teacher of the organization A expressed his disapproval of human reproduction cloning, because the principles in human reproductive cloning do not correspond to the concept of man reproduction in the Islamic religion. It is consistent with the view [28] that the teacher's belief is the foundation in his thinking. But what's interesting here is that religious values can be empowered or weakened by economic and human values. Just like cloning peas for the sake of zakat, it turns out to be undermined for humanitarian reasons, especially the food safety of genetically engineered products. For the cloning of sacrificed animals, religious values are reinforced by economic orientation, where the results of cloning victim animals can increase the supply of sacrificial meat so that the needs of society can be met. As far as human cloning is concerned, for therapeutic purposes it turns out that human values are more important than religious values, but if for reproductive purpose, the values of religion and humanity are equal in the teacher's argument. In this case, the teacher's knowledge of cloning, when implemented for controversial things, turns out to give rise to his scientific reasoning and literacy. This condition is as expressed [29], [30] that the literacy of science not only includes scientific knowledge but also involves the application of this scientific knowledge to making decisions about situations related to individuals and societies that have scientific and non-scientific components.

4 Conclusion

From the profile description of teachers' argumentation above, it can be seen that the argumentation of the teacher develops from disagreement, agreement with the conditions, agreed, and strongly agreed with the reason that turns out to be not only based on religious values. There are other values underlying the teacher's argumentation that are social and human values, economics, health as well as the environment. This proves that in arguing on the subject of cloning, a teacher is not only dismissed by the aspects of faith or religion, but also by the knowledge and experience of teaching in schools with Islamic-based organizations.

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