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INVESTIGATING MATHEMATICAL LOGICS IN SURAH YUSUF VERSE 25 UNTIL 29

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Abstract. Al Qur'an is Muslims' holy book which is not only as the source of laws but also as the source of knowledge. One of the knowledge that is contained in Al Qur'an and interesting to discuss is Mathematical Logics in Surah Yusuf verse 25 until 29. These verses contain not only exemplary stories for Muslims but also contain Mathematical Logics which worth to be understood by mankind — mathematical Logics in this verse such as implication and drawing a conclusion based on Ponens Modus.

Keywords. Mathematical Logics; Surah Yusuf; Implication; Ponens Modus.

A. INTRODUCTION

Al Qur'an is the Muslims' holy book that was revealed to Prophet Muhammad SAW and became his greatest miracle. Al Qur'an is believed and trusted by Muslims as a guide for all people. Al Qur'an contains the stories, guidances, laws, commandments, prohibitions, instructions, wisdom, and knowledge. The stories contained in Al Qur'an are not meaningless fictional stories. But every story in Al Qur'an has a purpose or mission to convey to the Prophet Muhammad. The stories contained in Al Qur'an are full of moral messages, namely a message that refers to the good and bad of an act that includes morality and character. We may say there are a lot of exemplary stories that can be used as very good lessons to be a good man, for generally.

وَنَرَأَنَا عَلَيْكَ الْكِتَبَ تِبْيَانًا لِكُلِّ شَيْءٍ وَهُدًى وَرَحْمَةً وَشُرِّي لِلْمُسْلِمِينَ

"And We have sent down to you the Book (Al-Quran) as clarification for all things and as guidance and mercy and good tidings for the Muslims. (QS An-Nahl:89)."

On the other side, one of the knowledge that is contained in the Qur'an is mathematics. Mathematics is a great creature that is the most powerful tool (Houston, 2009). Mathematics is not only about the number but also a set of ideas that influence our ways of thinking. They are about critical thinking and logical thinking. The second aspect is derived and can be practiced from our study of Logics. Thus, Mathematics is something that has a strong relationship with logic. We may say that logic is inside of Mathematics. The great contribution of Logics is mastering us in the term of basic knowledge to understand Mathematics especially and the others very well.

Based on religion reason, the reason why we choose Surah Yusuf as the object of review is because of the advice of Prophets and Apostles were sent to make perfect the character of human beings. This means that the moral problem becomes one of the most important things. As civilized beings, humans need values and references in behavior and society because, without these values and references, human life will surely fall into the abyss of destruction.

This perception leads us to study some verses of Al-Qur'an in Surah Yusuf, especially verse 25 until 29 to extract the essential information (if exists) of Mathematical Logics. The term of Logics will be derived from analyzing meaning from each verse and the relation among the verses. One of the concerns of researchers in this paper is Surah Yusuf verse 25 until 29 which implies the problem of logics as an important component in mathematics learning.

B. METHOD

This research is based on library research. A library research involves the step by step process to gather informations. The research conducted by identifying, analyzing, and developing the relevant informations. We collected some informations from Surah Yusuf verse 25 until 29 and their meanings, then we analyze each meaning based on Arabic grammar and mathematical approach

C. RESULT & DISCUSSION

To present a continuous story while delivering the reader to the essence of Surah Yusuf verse 25 until 29, here is the quote from them.

وَاسْتَبِقَا الْبَابَ وَقَدَّتْ قَمِيصَهُ مِنْ دُبْرٍ وَالْفَيَا سَيِّدَهَا لَدَ الْبَابِ قَالَتْ مَا جَزَاءُ مَنْ أَرَادَ بِأَهْلِكَ سُوءًا إِلَّا أَنْ يُسْجَنَ أَوْ عَذَابٌ آتِيهِمْ

"And they both raced to the door, and she tore his shirt from the back, and they found her husband at the door. She said, "What is the recompense of one who intended evil for your wife but that he be imprisoned or painful punishment? (QS. Yusuf: 25)."

قَالَ هِيَ رَاوَدَتِي عَنْ نَفْسِي وَشَهِدَ شَاهِدٌ مِنْ أَهْلِهَا أَنْ كَانَ قَمِيصُهُ قُدْ مِنْ قُبْلٍ فَصَدَّقَتْ وَهُوَ مِنَ الْكُذَّابِينَ

"[Yusuf] said, "It was she who sought to seduce me." And a witness from her family testified. "If his shirt is torn from the front, then she has told the truth, and he is of the liars. (QS. Yusuf: 26)."

وَإِنْ كَانَ قَمِيصُهُ قُدْ مِنْ دُبْرٍ فَكَذَّبَتْ وَهُوَ مِنَ الصَّدِيقِينَ

"But if his shirt is torn from the back, then she has lied, and he is of the truthful. (QS. Yusuf: 27)."

فَلَمَّا رَأَى قَمِيصَهُ قُدْ مِنْ دُبْرٍ قَالَ إِنَّهُ مِنْ كَيْدِكُنَّ إِنَّ كَيْدَكُنَّ عَظِيمٌ

"So when her husband saw his shirt torn from the back, he said, "Indeed, it is of the women's plan. Indeed, your plan is great. (QS. Yusuf: 28)."

يُوسُفُ أَعْرِضْ عَنْ هَذَا وَاسْتَغْفِرِي لِذَنْبِكِ إِنَّكِ كُنْتِ مِنَ الْخَاطِئِينَ

"Yusuf, ignore this. And, [my wife], ask forgiveness for your sin. Indeed, you were of the sinful. (QS. Yusuf: 29)."

Nahwu and Manthiq Studies

As we stated before, Al Qur'an is the holy book of Islam that is believed and trusted as a guide for all people. Al Qur'an contains the laws, commandments, prohibitions, instructions, wisdom, and of course knowledge. The Qur'an as a source of knowledge contains mathematical knowledge, especially about the logical matter. We may consider a part of Surah Yusuf verse 26 as the first implication.

إِنْ كَانَ قَمِيصُهُ قُدْ مِنْ قُبْلٍ فَصَدَّقَتْ وَهُوَ مِنَ الْكُذَّابِينَ

"If his shirt is torn from the front, then she has told the truth, and he is of the liars. (QS. Yusuf: 26)."

The letter “إِنْ” is a requirement letter or we can call it “*in-syarthiyya*” that means “if” The letter “إِنْ” accompanied by syarthiyya summation. Syarthiyya summation is a sentence that consists of three elements; they are ‘adaat ash-syarthi, the clause of the condition, and clause of the answer (Ayas, Iftikhar, & Bhutta, 2018).

Clause إِنْ كَانَ is syartiyya clause that consists of the letter “*in*” and the word “kaana” indicate that the events are already past so the Qur'an does not write it with “*in yakuunu*”. That means Yusuf's clothes torn in the front. Clause syartiyyah need answer clause. Yusuf's clothes that torn in the front is the evidence (ad-daal) if Yusuf is guilty (*al-madluul*). Yusuf clothes which torn in the front is indicate that Zulaikha is tried to avoid from Yusuf's seduction. Thus, it can be concluded that Yusuf is guilty.

Then second implication is the clause from Surah Yusuf verse 27.

وَإِنْ كَانَ قَمِيصُهُ قُدَّ مِنْ دُبُرٍ فَكَذَبَتْ وَهُوَ مِنَ الصَّادِقِينَ

“But if his shirt is torn from the back, then she has lied, and he is of the truthful.”

The fact is that Yusuf's clothes was torn in the back indicates that Yusuf's clothes were torn due to someone else. Therefore, it was Zulaikha who tried to chase Yusuf and she tried to pull Yusuf's clothes to tears. Yusuf tried to avoid Zulaikha seduction. In the study of manthiq, the torn of Yusuf's clothes can be used as “ad-daal” (proof) that Yusuf was not guilty (*al-madluul*).

From this Al Qur'an story, related to Yusuf and Zulaikha, we can take a lesson that Islam teaches us the urgency of doing reasoning and thinking logically. Reasoning and thinking logically are very important to make a fair and non-discriminatory decision. This is similar to the command of Allah written in the Qur'an as follows:

إِنَّ اللَّهَ يُحِبُّ الْمُقْسِطِينَ

“Do fair, because God really likes those who do justice. (QS. Al-Maidah: 42)”.

Mathematical Logics in Surah Yusuf Verse 25 until 29

We have already studied about reasoning in Surah Yusuf verse 27 that using empirical observation and decision making activity in Surah Yusuf verse 28 based on the facts given. From the two previous activities previously, there are several important concepts of Mathematical Logics such as the concept of implication, conclusion, and validation.

In the concept of implication, we know about hypotheses/antecedent and conclusion notated mathematically as $p \rightarrow q$ which p as hypotheses and q as conclusion which read as “If p , then q ”. Recall Surah Yusuf verse 27 as the first premise.

وَإِنْ كَانَ قَمِيصُهُ قُدَّ مِنْ دُبُرٍ فَكَذَبَتْ وَهُوَ مِنَ الصَّادِقِينَ

“But if his shirt is torn from the back, then she has lied, and he is of the truthful.” (QS. Yusuf: 27).

Therefore, from Surah Yusuf verse 27 we can transform it into mathematical logics notation and get the first premise.

Premise 1: $p \rightarrow q$

with

p : Yusuf clothes torn from the back

q : Zulaikha was lie and Yusuf was truthful

Then, recall from Surah Yusuf verse 28:

فَلَمَّا رَأَى قَمِيصَهُ قُدَّ مِنْ دُبُرٍ قَالَ إِنَّهُ مِنْ كَيْدِكُنَّ لَآنَّ كَيْدَكُنَّ عَظِيمٌ

“So when her husband saw his shirt torn from the back, he said, “Indeed, it is of the women's plan. Indeed, your plan is great. (QS. Yusuf: 28).”

From this verse, we conclude that Yusuf's shirt was torn from the back. Therefore, from Surah Yusuf verse 28 we can transform it into mathematical logics notation and get the second premise.

Premise 2: p

with

p: Yusuf clothes torn from the back

To conclude this circumstance, we can elaborate on the premises we got and using ponens method to draw conclusion. The general form of ponens method as describe as below

<i>Premise 1: p</i>	<i>q</i>
<i>Premise 2: p</i>	
<hr/>	
<i>Conclusion: q</i>	

For example:

Premise 1: If Yusuf clothes torn from the back, then Zulaikha was lie and Yusuf was truthful

Premise 2: Yusuf clothes were torn from the back

Conclusion: Zulaikha was lying and Yusuf was truthful

Hence, from Surah Yusuf verse 28 we get premise 1 "If Yusuf clothes were torn in the back, then Zulaikha was a lie" and premise 2 "Yusuf Clothes is torn in the back". Hence, the conclusion was Zulaikha was a lie.

Learning Mathematics Contribution

Learning mathematics is also emphasize critical and logical thinking skills, both as individual and classical. Gradually, this will influence and contribute to increasing human thinking capabilities. If one gets used to thinking logically, this can influence his/her attitude and behavior. Some experts explained similarly with respect to education purposes or mathematical learning. They are:

1. Arthur W. Foshay in Huda, Yusuf, Jami, and Zakaria (2016) :
 "The one continuing purpose of education, since ancient times have been brought to people as a full realization as possible. Other statements of educational purpose have also been widely accepted: to develop the intellect, to serve social needs, to contribute to the economy, to create an effective work force, to prepare students for a job or career, to promote a particular social or political system. These offered purposes are undesirably limited in scope, and in some instances they conflict with the broad purpose I have indicated; they imply a distorted human existence. The broader humanistic purpose includes all of them, and goes beyond them, for that to encompass all the dimensions of human experience. "
2. Martin Luther King Jr., inside his speech at Morehouse College on year 1948 conveyed that :
 "The function of education is to teach one to think intensively and to think critically. But education which stops with efficiency may prove the greatest menace to society. The most dangerous criminal may be the man gifted with reason but no morals. ... We must remember that intelligence is not enough. Intelligence plus character - that is the goal of true education." (Foshay, 1991)

3. John Dewey (The Philosopher, 2000) declared that :

"The purpose of education has always been to everyone, in essence, the same - to give the young the things they need to develop in order, the sequential way into members of society. This is the Australian bush before the coming of the white man. It is the purpose of the education of youth in the golden age of Athens. It is the purpose of education today, whether this education goes on in a one-room school in the mountains of Tennessee or the most advanced, progressive school in a radical community. But to develop into a member of society in the Australian bush there is nothing in need of a society of ancient Greece, and still less with what is needed today. Any education is, in its forms and methods, an outgrowth of the needs of the society in which it exists."

The values or mathematical passions which are contained in Al Qur'an:

1. Stories in Al Qur'an can be used as a conceptual, normative foundation and strategic steps in looking at and seeking solutions to the problems of modern society which are spiritual alienation and moral degradation (Sardar, 1992).
2. Connected to this Ibn Kathir emphasized: "The story is seen as one of the most important media to convey moral messages, education, teaching, and constructive thinking. Because in general, the story can be accepted by all levels of humanity with its diversity of characters and characters, ranging from children, adults to parents (Katsir, 2008).

D. CONCLUSION

From the explanation above, we may conclude that Al Qur'an gives us mathematical learning through mathematical logic. Surah Yusuf verse 25 until 29 not only teach us the story of Prophet Yusuf and his noble character but also encourage us to use logical reasoning to solve problems. Each of the verses could be transformed into premises; then from premises through logical reasoning, we can conclude. From these verses, Ponens Modus are used to conclude.

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