CHARACTER EDUCATION IN MATHEMATICS LEARNING IN THE ERA OF DISRUPTION

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ABSTRAK

Tantangan di era disrupsi membentuk karakter yang baik menjadi bagian penting untuk mendidik manusia berkualitas. Artikel ini mengupas tentang pendidikan karakter yang dapat dikembangkan melalui pembelajaran matematika dan yang dapat diwujudkan dalam pembelajaran matematika di era disrupsi. Kemudian, hasil dari penelitian ini yaitu (1) mengetahui bahwa pendidikan karakter di era disrupsi merupakan suatu pendidikan yang sangat penting untuk bekal menghadapi dunia. (2) Pembelajaran matematika menjadi pembelajaran yang relevan dalam penanaman pendidikan karakter yaitu melalui materi, soal, dan penyelesaian masalah di dalamnya. Hal tersebut harus digali dan dimunculkan sehingga intisari dari pendidikan karakter dapat berkembang dalam diri peserta didik. Contohnya penyisipan materi adab berbagi dalam soal cerita matematika. (3) Pendidikan karakter dalam pembelajaran matematika yang mewujudkan sikap disiplin, jujur, kerja keras, logis, kritis, kreatif, dan inovatif merupakan karakter yang diperlukan untuk menghadapi era disrupsi ini. Penelitian ini merupakan penelitian deskriptif kualitatif dengan menggunakan metode studi literatur dalam pengumpulan serta analisis data.

Kata kunci: Karakter, adab, matematika, era disrupsi.

ABSTRACT

The Challenges in the era of disruption to shape good character are an important part of educating quality human beings. This article explores character education that can be developed through learning mathematics and which can be realized in learning mathematics in the era of disruption. Then, the results of this study are (1) knowing that character education in the era of disruption is an education that is very important to prepare for the world. (2) Mathematics learning becomes relevant learning in the cultivation of character education, namely through materials, questions, and problem-solving. This must be explored and raised so that the essence of character education can develop in students. For example, inserting material for sharing etiquette in math story problems. (3) Character education in mathematics learning that embodies disciplined, honest, hard-working, logical, critical, creative, and innovative attitudes is the character needed to face this era of disruption. This research is a

qualitative descriptive study using the literature study method in data collection and analysis.
Keywords: Character, manners, mathematics, disruption era

INTRODUCTION

Currently, Indonesia is experiencing some major and fundamental changes called the era of disruption. The occurrence of this change becomes a challenge for the Indonesian nation. Disruption is a lifestyle change that changes the order of society, especially in the world of education such as science, morals of the nation, etc.

This era of technological disruption has a character that is fast, broad, profound, systematic, and significantly different from the previous situation. Technology has two opposite roles, namely being the best friend and enemy of man. The fading of character education is one example of the negative side of technological development. This is characterized by the emergence of cases of misappropriation of character education in society such as fighting, harassment, corruption, intolerance among others, and bullying.

Seeing the news of education that is considered to fail in achieving its task of shaping the character of the nation's children. Planting mathematical values can be a solution in teaching good character education. Among them is the application of mathematical attitudes, namely honesty, creativity, innovation, and tolerance.

This study uses the literature study method in the form of procurement of data collection activities, libraries, reading, and recording, as well as managing research materials.

This article seeks to discuss character education in mathematics learning in the era of disruption.

DISCUSSION

Character Education

The default word character, derived from the Greek "harassing" which means carve. Characters are like carving gemstones or hard iron surfaces. Until now character definitions have evolved as a special sign or pattern of behavior. (Johansyah, 2011:87). In the Great Dictionary of The Indonesian Language, the term "character" is

interpreted as habitual, psychological, morals, character, or ethics that distinguish one from another.

The definition of character in the Islamic perspective is called morals or Al-khulq as the origin of the mufrod/singular form of the word morals which is interpreted as one's temper, behavior, and mental image. The description of the two sides of man is the Lahiriyah side means philosophical while the Batiniyah side means the positive or negative spirit that becomes the nature of the creation of man. Jalil (2012:181) Islam explains that character is the education of noble morals (akhlaq karimah). Prophet Muhammad SAW said :

أَلاَ وَإِنَّ فِى الْجَسَدِ مُضْغَةً إِذَا صَلَحَتْ صَلَحَ الْجَسَدُ كُلُّهُ ، وَإِذَا فَسَدَتْ فَسَدَ الْجَسَدُ كُلُّهُ . أَلاَ وَهِىَ الْقَلْبُ

"Remember that there was a lump of flesh in the body. If he is good, then the whole body is good. If it is damaged, then the whole body is damaged. Know that he is the heart" (HR. Bukhari no. 52 and Muslim no. 1599).

Education is a pillar that determines the fate of a nation, with the future education of a nation can be built to achieve a dignified nation (Sulistiyowati, 2013:320). Education is an asset for the nation, especially in the Republic of Indonesia (Sofyan *et al, 2*018:34). No wonder if the nation's assets become a driver to facilitate character development amid the many community riots that start from the character problems of each individual. Therefore, through character education, the nation can be improved.

The development of the term new character education appeared in the last decade in the United States, including those used in Indonesia in the last two years but character education has been warmly discussed because the character can be an educational innovation to overcome the problems of Indonesian society.

From an ontological perspective, character education is an educational collaboration effort from three aspects, namely knowledge, feelings, and deeds. Character education is contained in eighteen values, namely: religion, honest, tolerance, discipline, hard work, creativity, independence, democratic, curiosity, national spirit, love of the homeland, respect for achievements,

riendly/communicative, peace-loving,

fondness of reading, environmental care, social care, and responsibility. As in Surah Al-Ahzab verse 21 which reads:

لَقَدْ كَانَ لَكُمْ فِيْ رَسُوْلِ اللهِ اُسْوَةٌ حَسَنَةٌ لِّمَنْ كَانَ يَرْجُوا اللهَ وَالْيَوْمَ الْاٰخِرَ وَذَكَرَ اللهَ كَثِيْرًاۗ

It means: "Indeed, there is in the Messenger of Allah a good example for you for him who hopes for Allah and the Last Day, and remembers Allah much."

Mahatma Gandhi (Elmubarok, 2008:78) says that one of the fatal sins is "education without character".

The emergence of the phenomenon of the tendency of society and school only spurs students to have high academic ability without being balanced by the formation of strong characters into the challenges of the era of disruption inputting character education in the right position.

The existence of character education is indispensable in all areas of life such as schools, houses, communities, etc. Character education is not only intended for children but also adults in the face of global competition that will arise in the following years. All nations must stand shoulder to shoulder with this responsibility. So that character education does not disappear at the level of discourse and ideas only.

Mathematics Learning

Learning can be obtained on various occasions but generally learning is understood only limited to the school bench. Learning in school has the goal to acquire knowledge that will be needed by students in their lives.

In the Qur'an surah al-Mujadilah: 11, Allah said: *"... Allah will raise those of you who believe and those who have been given knowledge in degrees."* This shows that there are many benefits in seeking knowledge and there is no harm in spending time to become a scientific person. Every human being since the time of Adam has also done the process of learning from God about science, this is stated in the Qur'an surah Al Isra verse 70 which means: "*And Allah teaches Adam the names (things) entirely, then presents them to the angels and says: "Mention to Me the names of those things if you are truthful!"*."

Mathematics has an important role in a variety of disciplines. Being

the source of the presence of advances in science, judging by the many developments of disciplines that can not be separated from the formulas that are always related to mathematics.

The process of learning abstract mathematics should not include the mastery of concepts and theories only, but also the value of application in real life or called mathematical skills that are applicative means abilities such as collecting, presenting, analyzing, and interpreting data, and can communicate it in a discussion forum or at least to others. Mathematics learning is very meaningful when it comes to character education because mathematics is general science.

There are many obstacles to achieving meaningful mathematics learning, one of which is the reality of students' displeasure with math lessons because they have difficulty learning mathematics, this shows that teaching mathematics is not easy because math learning is abstract. In this case, the learning method used must be precise and strive to present mathematical materials related to everyday life that are easy to understand. According to NCTM or National Council of Teachers Mathematics quoted by Maryanti (2012:2), there are five competencies in mathematics learning, namely mathematical problem solving, mathematical communication, mathematical reasoning, mathematical connection, and mathematical representation.

Thinking mathematics is a high mental activity, therefore thinking mathematics will concern mental structure (Hudojo, 1988:56). Mathematics is also known as deductive science, meaning that in the process of working these mathematics must be deductive. Where the way of thinking that begins with the proof of a statement of a general nature is then continued with the withdrawal of conclusions of a special nature. The concept of applying this deductive way of thinking to determine coherent and logical thinking is what causes mathematics is a science that can be used as pure and applied science (Sulistiani, 2016:607). The implications of this science are widely used to meet the needs in all fields, for example in the fields of economics, science, technology,

industry, and others. Based on Law No. 23 of 2003 on The National Education System Article 37 paragraph 1 states that "the curriculum of primary and secondary education must contain mathematics".

The learning process of mathematics in schools refers to the three core functions of mathematics, namely as tools, thinking patterns, and insights. In addition, an important part of the purpose of mathematics learning is the formation of mathematical attitudes to prepare students to be able to face the changes and developments of the times based on logical, rational, critical, careful, effective, and efficient thinking.

The four pillars of education from UNESCO, namely *learning to know, learning to do, learning to live together, and learning to be*. Implementation in mathematics learning can be seen in learning and assessment that is learning to know *(facts, skills, concepts, and principles), learning to do (doing mathematics), learning to be (enjoy mathematics), and learning to live together (cooperative learning in mathematics)* (Surya, 2017:18).

The peculiarities of the elements in mathematics learning lead anyone who learns it to be able to think critically. Glaser (Sumarmo, et al., 2012:21) states that critical thinking in mathematics is an ability combined with prior knowledge, mathematical reasoning skills, and cognitive strategies, to generalize, prove, evaluate mathematical situations reflectively. Critical thinking skills in mathematics learning can be developed through the Teaching and Learning Activities (KBM) process guided by indicators of critical thinking skills put forward by experts.

In the latest Curriculum 2013, it is mentioned that the problem-solving approach is a focal point in mathematics learning that includes closed problems with a single solution, open problems with non-single solutions, and problems in various ways of solving. To improve problem-solving skills need to be grown problem understanding skills, create mathematical models, solve problems, and interpret the solution. (Kemendikbud,2016). In every math lesson, in solving problems that occur the teacher will encourage students to:

1. thinking about all phases of the problem
2. identify existing sub-issues
3. thinking about information that will help in solving problems
4. selecting data references related to issues
5. imagine all the ideas that might be applicable
6. consider the various solutive steps to conduct testing
7. choosing the right way to test
8. consider all the possibilities that will arise in the implementation of problem-solving measures
9. decide on the completion of the answer

From the advice conveyed by the teacher, students will get the value of learning about careful attitude, conscientiousness, hard work, creative thinking, innovation, effectiveness, and efficiency in acting (Sujadi, 2018:12).

The cultivation of character education to students through mathematics learning can also be done by including religious values in it, this is because Islamic religious values play a role in creating and educating the character of students. Combining mathematical learning with Islamic values can use inter-disciplinary approach methods, namely by inserting some Kauniyah verses in the Quran into the learning material in deepening and strengthening the meaning of understanding that will be produced. When combining mathematics learning with Islam there are strengths in forming characters, as follows:

1. The power of the concept

Mathematical concepts have essentially had power. Where each completion process has its role in educating the character of students. Can be seen in every workmanship that mostly has finishing techniques and can be done in any way to improve the character of students to be innovative, creative, unyielding, and patient. In addition, the concept of mathematics learning that often has a process can be visualized with a method of workmanship that will develop the character of the student into a responsible figure with what he does.

2. The power of learning methods

To establish character through the process of learning mathematics, the method of imprisonment becomes

a crucial thing to be noticed and becomes a force that can not be abandoned. Sorting the right methods will be very influential in educating the character of students. An example is the contextual learning method of the concept of building a space that can be actualized through learning called thematics which is culture-based learning which will connect the concept of mathematics with the life or culture of the archipelago. Thus, improving the character of students in preserving local wisdom in the era of progress and global competition.

3. Strength of character of the teacher

The power of educators is important to all educators in a variety of disciplines. Teachers as role models as treated and imitated figures must have a capable character so that students can imitate the explosiveness exemplified by the teacher.

In the process of learning mathematics, a teacher must pay attention to the three aspects above, for mathematics to be a meaningful science and can grow the character of students.

Character planting through the concept of mathematics that integrated the value of religious Islam / tawhid spirit in the concept of mathematics applied in the concept of algebraic material: For example in algebraic material a student is asked questions by the teacher, namely:

complete the following form of algebra $x + y - 5x = 7y$.

A teacher of the issue should emphasize that there is a value of character formation that is a coefficient of one that is not written but the value is there. This means that something that exists does not have to look like God it is believed to exist but is not visible (Ariningsih &Amalia, 2020:6).

Character education through mathematics learning can indeed be attributed to Islamic values and general learning. However, the values in mathematics learning are expected to be meaningful when they are derived from the learning planned by the teacher and applied by the student in his or her. The design of good mathematics learning will also increase the provision of reflection and strengthening the value of mathematics learned in character education in everyday life.

Character education in mathematics learning in the era of disruption

At seminars or social media, the word disruption has been widely discussed lately. Sunday, August 26, 2018, the minister of employment of the Republic of Indonesia, Mr. Muhammad Hanif Dhakiri was a guest at the Nurul Jadid Paiton Probolinggo campus. He said "Graduates are not enough to make people successful and successful, it takes something new, creativity, and must be responsive in welcoming change. If we just stay in place not making meaningful changes then sooner or later we will be left behind from other countries that have prepared themselves to welcome the era of disruption. So in this case students must be creative, innovative and responsive in facing challenges and opportunities in the future". (Sholekhah, 2019:70).

The industrial revolution first came about in the 18th century around 2000, when many advanced steam-powered machines were discovered that humans then utilized by switching to mechanical production machines. The development of the industrial revolution is characterized by the era of disruption, with the emergence of digital or online-based industries not only computers but mobile digital technology that has spread to all walks of life, so that everyone can communicate with each other online nearby or remotely though (Hendayani, 2019).

The era of disruption is an era where communication and technology are increasingly advanced, sources of information obtained not only from one or two media but there are tens of thousands who can be carriers of new information and knowledge for students. Education in the era of disruption is an activity carried out by teachers to guide and direct students to learn for themselves. The environment is very influential in the process of growing and developing the potential of learners. The ability to hone the potential to create knowledge, and be interpreted it uniquely, and finally realize the potential it has (Rasiman, 2019:2). So everyone is required to develop their potential for themselves and society so that the creation of a new thing (Sujadi, 2019:8).

The era of disruption in the 21st century contains *4C (Collaboration, Communication, Creativity, and Critical thinking)* competencies, four points must be faced by the educational element. In learning, teachers and students must master these competencies, especially critical thinking (Rasiman, 2019:2). According to NCTM or National Council of Teachers Mathematics quoted from Maryanti (2012:47) there are five competencies in mathematics learning, namely *mathematical problem solving, mathematical communication, mathematical reasoning, mathematical connection, and mathematical representation.* Mathematics learning produces students who have reason and personality and good character. In line with that, through government regulation No. 19 of 2005 on National Standards of Education, mathematics subjects aim to:

(1) So that students can understand, explain and apply the concept appropriately in problem-solving;
(2) Train learners in using reasoning and drafting mathematical ideas and statements;
(3) solving problems and interpreting the solutions obtained;
(4) Ideas are poured in the form of symbols, tables, diagrams, or other media to clarify problems or problems;
(5) By studying mathematics, students are expected to have an attitude of appreciating the usefulness of mathematics in life, such as curiosity, attention, and then a sense of interest in learning mathematics, as well as a tenacious and confident attitude in problem-solving (Rudyanto, 2018:39).

Not only that, but the Qur'an also motivates to study mathematics as found in surah Yunus verse 5 which means*"He is the one who makes the sunshine and the moon glow, and He ordains places for the journey of the moon so that you know the number of years and the calculation (time). Allah did not create it except with truth. He explains the signs (his greatness) to those who know"*.

Mathematics is "half real and half occult" so mathematical objects are abstract and in symbol language. In understanding real objects a

rationalist, empirical and logical approach is required (Bayani and Burhani). While occult objects require an intuitive, imaginative, and metaphysical approach (Irfani). The main strength of mathematics lies precisely in imagination or intuition which is then proven logically or deductively. Therefore, it is necessary to combine three approaches in learning mathematics, namely Bayani, Burhani, and Irfani approaches. Paradigm thinking the merger of the three approaches is called paradigm ulul albab (Nasution, 2017:8).

In some surahs in the Qur'an such as surah Al-Hijr [15]: 19, Al-Qomar [54]: 49, Al-Furqaan [25]: 2, and others contain the meaning of mathematical concepts about algebra (including numbers). While the mathematical concept of the set is contained in surah al-Fathir verse 1 and surah an-Nur verse 45 in the letter contained the meaning of a collection of objects that have very clear characteristics. The concept of Statististika is found in Surah al-Kahfi (No. 18):49, az-Zukhruf [43]:80, including verses explaining records and recording data. Similarly, Surah Al Jaatsiyah verse 29, Al Qomar [54]: 52, Maryam [19]: 94. In Sura Al Hujurat [49]:6, Al Baqarah [2] : 242, Al Hadid [57] : 17, Al Shuaraa [26]: 28; contained concepts about logic. Geometry and Measurement are found in surah Al Ankabut (No. 29):56; Fatir [35] : 27; Adz Dzariat (No. 51) : 3; Al Insyiqoq [84] : 3 and others (Nasution, 2017).

The implementation of effective character education is implemented in the teaching and learning process. as hadist al-Bukhari from Numan bin basyi which means *"Know that in the body there is mudghah which when it is good then it is good all body and if it is damaged then damaged the whole body; know that mudghah is qalb"* (Sajadi, 2019:23).

Mathematics education has the values contained in the material as well as the learning. Math values need to be excavated and raised so that students realize that they can instill and implement them.

Like the example of the following question

Mr.Dul has 17 nastar cakes, then he gives them to Tul and Nik as gifts. Mr.Dul asks Tul to distribute nastar cake to Nik fairly. Mr. Dul stressed that if the nastar cake is not

divided fairly it will cause disputes and quarrels.

From these problems we know that the value of honesty, justice, compassion, and friendship will arise when the learning can be applied well, and vice versa.

Other examples

When taking a bath, Neng has a habit of turning on the water faucet. It takes 10 minutes to take a shower. If in a day Neng bathe twice with the discharge of water flowing in the faucet 8 liters per minute, then every day the faucet will flow 160 liters. Based on the above issue how many liters of water are wasted in a week?

The moral value that can be learned from this example is a culture of being thrifty and grateful. Even though clean water is a renewable natural resource, we are not allowed to use water excessively because in some areas water can be scarce. Allah also taught his servants not to do anything excessively.

The two sample questions above show that the material in learning mathematics has the potential to increase good character. This will run optimally if the teacher understands the character values contained in mathematics both in the material and in learning. Teachers are required to learn every value contained in mathematics because a good character will continue to be embedded in the minds of students if it is properly implemented and implemented into a custom (Sholekhah, 2019:71).

CONCLUSION

The challenges of the era of disruption make the character an important part of educating quality human beings. In this era of disruption, the challenge to form a good character is a challenge for all of us. The character can be formed through mathematics education that has values in the material and learning. Where these values must be explored and raised so that the essence of character education can develop in students. For example, the insertion of material for sharing etiquette and moral values of religion in math story problems. Cultivating character in mathematical activities can also be based on the nature of learning mathematics that is disciplined, honest, hard-working, logical, critical, creative, and innovative.

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