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The attitude of risk taking Islamic junior high school (MTs) students in learning mathematics

Y Yuni*, Darhim and Turmudi

Department of Mathematics Education, School of Post Graduate Studies, Universitas Pendidikan Indonesia, Bandung, Indonesia.

*Corresponding author’s e-mail: yutha8848@gmail.com

Abstract. This study aims to determine the risk-taking attitude of students at Islamic Junior High School (MTs) in Bekasi towards learning mathematics. This is a preliminary research to get information about risk taking attitude in order to conduct next research. Data are obtained by providing questionnaires of 20 indicators, which includes be careful in act, having peace of mind, resolute in making decisions and confident in the act. Respondents are as many as 97 students of 7th grade students of MTs and taken with random techniques from two MTs in the city of Bekasi. The research instrument was adopted from DOSPERT developed, adapted to the ability of 7th grade students of MTs. The attitude of risk taking is part of the student's responsibility attitude to the learning of mathematics, either during preparation, process or after learning mathematics. The attitude of risk taking is important to know in order to be trained continuously. Because the trained attitude of risk taking will make students succeed in learning and working later.

1. Introduction
The process of realizing the intelligent and prosperous society requires knowledge, strategy, struggle, and sacrifice. In this case education is an appropriate container to start "educating" the nation's children from an early age. The world of education has scientists, experts who have familiar strategy of struggle and want to sacrifice for the sake of improving the quality or the quality of graduates. Social theory Pip Jones, et al states that a smart graduate must have high creativity [1]. People who are smart and creative in the course of his life will be successful and prosperous.

The superior man, of course, is to make a decision taking into account all the risks that would be acceptable. The risks received are more inclined towards a harmful act, but the losses will be minimalized. This attitude is called risk taking.

1.1. Theoretical Study

1.1.1. Risk Taking Attitude. As far as researchers concern, no studies are ever conducted related to risk taking attitude in mathematics learning. Knowingly or not, the general process of completing math problems always requires risk taking attitude. Therefore, in defining risk taking in this study, they adopt it from social studies.

Basically, the human soul is divided into two aspects, namely the ability and aspects of personality. Djaali classifies aspect of ability to include learning outcomes, academic achievement, intelligence and talent; whereas the personality aspect includes the character, nature, adjustment, interest, emotion,
attitude and motivation [2]. Furthermore, Djaali stated ability and personality will be revealed through behaviour [2]. Risk taking or attitude to risk that will be examined is part of the attitude of responsibility a person who will be reflected at one’s behaviour.

Meaning of the word risk according to Indonesian Dictionary is “less favourable result,” it will be more inclined to hurt and harm. This means that when a person must decide from many options it will not be a fun job. But a choice that requires considerable good or bad, profitable or loss, dangerous or not, that all options are more towards harmful and dangerous. As a common example occurs in someone who has graduated, there are two options that arise in his mind; will go to college or work? If you go to college you must be prepared with considerable cost, the test to be faced, and may be separated from the family in a long time if the lecture is conducted outside the city. If you want to work you should be prepared with the process of applying for a job, chances that you are often rejected than accepted, fees or start-up capital, a small salary with a heavy workload (as inexperienced), and so forth. When you face a choice like this, then the decision must be taken if you want to continue living, of course with all the risks and consequences.

The ability to take risks is part of the character or personality. The process of formation of student character can be described in the following Figure 1 [3]:

![Figure 1](image)

**Figure 1. Process to Shape Learner’s Character**

Based on Figure 1, a person’s character can be formed because of his way of thinking, and thinking ability can be trained by learning.

Decision making (risk taking) is the most important attitude for an individual [4], which will have an impact on someone’s social life. The impact of the decision-making course has been considered not only influence good or bad for the decision-maker, but also for someone’s social relations. It is this factor that sometimes makes a person difficult to take decisions quickly. Many things must be considered before decisive "decisions" are taken. Sometimes because too great risk shall be borne, someone may finally adrift in doubt, even though a lot of people waiting for his decision (usually it is a management decision). Finally, the social life of people is so constrained and uncertain. Not infrequently success was delayed because of doubts or wrong in taking decisions.

This theory about risk taking that people can use their personal competencies to affect the probability of success or failure in life [5]. They will be motivated to choose the level of risk in accordance with their competence and are believed to be in their favour. A risk in taking decisions must be built on each individual. Build up the courage to take risks or risk taking should be trained continuously. This should have been done early when children are at the stage where it hurts can understand and are not ill, for example, when they learn to walk. He knew when the initial step will certainly fall, and it feels discomfort but they can bear the risk of falling and the sickness that they are managed to walk. If they are afraid to do it over again, then the process would be obstructed or took longer time to learn. Taking risks could be positive or negative, in accordance with the opinion of Leigh who states that: Risk-Taking Reviews behaviours that involve; some potential for danger or harm, also while providing an opportunity to obtain some form of reward [6]. Furthermore, Byrnes, Miller and Schafer and Leigh stated the similar thing: risk taking encompasses a broad range of behaviours that fall along both positive and negative dimensions [4,6]. Risk has two possible behaviours, they could be on the positive side or negative, beneficial or detrimental.

1.1.2. Correlation between learning mathematics and risk taking. The process of learning mathematics, especially when solving math problems, the decision made is a probability, or chance. Opportunity was 50% correct answers, or otherwise 50% obtained a wrong answer. If the decision is already taken into consideration because it is based on observation, experience or knowledge, then what is the answer even
though it is wrong it will be readily accepted and ready for reparation. But if not dare to take the risk, then there is no courage to solve mathematical problems by the teacher. Always feel free to start work on a settlement, which ultimately is only visible matter alone and never answered.

Take a decision or risk taking is influenced by the development of "neuroscience" [7]. What is meant by neuroscience is human behaviour from the perspective of the activities that occur in the brain. Where, according to Steinberg is the changes in the brain system coincided with the maturation of the reproductive pushing risk taking will be adaptive evolution [7]. The brain plays an important role in behaviour. The brain will be trained to the maximum through continuous learning activities and regular. Learned that maximize brain function including the learning of mathematics. Learning math is done continuously and regularly is the learning of mathematics in formal schools. Then build a brave attitude in making decisions (risk taking) should be trained when children start early adolescence (puberty) around the age of 10-18 years to study mathematics at school. Generally, children this age are very brave in risk taking but careless attitude and always full of risk adverse.

Steinberg describes the risk taking ability of the sample studied between the ages of 10-30 years are described as bends or curves [7]. At the age of adolescence (puberty) around 7-29 years is at the stage of development (using Connors Impulsiveness Scale). Instead Leshem & Glicksohn states that a significant decline from the age of 14-16 to 20-22 (using Eysenk & Barratt Impulsiveness) [8]. Usually at the age of adolescence to early adulthood ahead, making decisions and risk-taking ability is too fast and brave, somewhat ignoring considerations or the impact of the decision. Tend to be careless because of the immaturity of emotion. However, over the emotions and hormones which are more mature at the beginning of adulthood, the risk taking ability of more consideration. Considerations based on understanding, experience of previous observations even an attitude of responsibility. Therefore the risk taking ability of students at secondary school age must be built with the exercises solve problems in mathematics lessons to be better trained, not sloppy and ready to face the risks of the decisions that have been taken. Is the answer or settling on the idea that appears to be incorrect, or if one is ready to be repeated with ideas and other ways. So that will further enhance the students' attitude of responsibility on his duties.

Based on experts’ opinions that have been described, it can be arranged indicator of risk taking in this study, which is described as follows Figure 2:

![Figure 2. Indicators of Risk Taking Chart](image)

1.2. The Purpose of study
Every research must have a purpose. Similarly, this study, the purpose of this research is to know the attitude of MTS students risk taking, to the learning of mathematics. Other than that the results of this study as information to mathematic teachers, in order to train continuously the attitude of risk taking so that students become individuals who are responsible for all decisions taken with all the risks that have been calculated before. Later the attitude of trained risk taking will lead someone to be more responsible
on the tasks. A person who responsible will of course be accepted and successful wherever they will works.

2. Methods

2.1 Participants

The sample in this study is the seventh grade students of four accredited A-MTs. chosen purposively, because they are related to a particular purpose. Purpose with purposive technique, the sample is determined directly by the researchers and the school (principal and math teacher). This is in accordance with the opinion of Nasution [9], the subject of the study sample is only as a source and can provide information. Samples can be things, events, people, or situations that are observed.

Nasution’s opinion is supported by Piaget's cognitive development theory which states that the average 12- to 13-year-old child is even more in the formal operational stage. This age they are still in transition from elementary school to high school [9]. Of course, the most needy period of guidance in any case, including decision-making. During elementary school age they always just imitate and follow the orders of teachers, in Junior High School or MTs. They should have started to be independent. Of course this seventh grade student, who is still in transition, has an objective and objective way of thinking to be helpful in this research. Therefore, in order to be in accordance with the purpose of the researcher, the grade 7 students of MTs. Selected as a sample in this study, which is 97 students randomly from four MTs where is located in Bekasi.

2.2 Instruments Test

The instrument used to obtain data in this study used a questionnaire adopted from the DOSPERT risk taking behaviour (Domain Specific Risk Taking) tool from Weber et al [10]. However, it has been adapted to the sample at 12-13 years of age that is still undergoing a transition period, the developmental period (Steinberg) is a change from childhood into adolescence (puberty). Choice of answers is also simplified from 7 to 4 adapted to student’s cognitive abilities. The choice of questionnaire answers that become sample choice are: ALW is Always, if never abandoned; OFT is Often, if never done once only once; SMT is Sometimes, more do not do; NVR is Never, never done even though once.

The research instrument was firstly validated by 3 mathematicians (1 lecturer), 1 evaluation expert, 2 math teachers and 2 Indonesian teachers, and 1 psychologist (psych test institution). The Validation to measure instrument readability, conformity with indicators and aspects of construction (20 Item).

Furthermore the data is calculated statistically with Friedman test. Statistic calculation with the help of SPSS ‘20 program and obtained the following results:

| Table 1. Friedman Test |
|------------------------|
| N | Chi Sqr. | df | Asymp. Sig. |
|---|----------|----|-------------|
| 9 | 27.820   | 19 | 0.087       |

The Friedman test is used for reasons of scoring used instead of dichotomous scores. Based on the calculation results with the help of SPSS 20 Asymp. Sig. > 0.05, this means H0: cannot be rejected so that all validators have the same opinion about the research instrument (risk taking attitude). So it can be concluded for all risk taking questionnaire instruments can be used.

3. Results and Discussion

3.1. Result of Study

Scoring techniques use a score range of 1-4 (continuum data). The reason for not being too extreme in giving an assessment, if using a score of 0 and 1 (dichotomy) then the instrument directly rejected or
accepted, while the attitude assessment is not too rigid, especially at the age of transition. A valid questionnaire was given to 97 MTs students and the following data were obtained (Table 2):

| Number item Questionnaire | Answer Options (%) | Equal (%) |
|---------------------------|---------------------|-----------|
|                           | ALW | OFT | SMT | NVR |
| 1                         | 25.77 | 45.36 | 28.87 | 0 | 100 |
| 2                         | 27.84 | 26.80 | 41.24 | 4.12 | 100 |
| 3                         | 27.83 | 22.68 | 31.96 | 17.53 | 100 |
| 4                         | 23.71 | 25.77 | 28.87 | 21.65 | 100 |
| 5                         | 34.02 | 16.49 | 25.77 | 23.72 | 100 |
| 6                         | 52.58 | 25.77 | 18.56 | 3.09 | 100 |
| 7                         | 43.30 | 16.50 | 25.77 | 14.43 | 100 |
| 8                         | 21.65 | 20.62 | 43.30 | 14.43 | 100 |
| 9                         | 25.77 | 35.06 | 36.08 | 3.09 | 100 |
| 10                        | 27.83 | 21.65 | 28.87 | 21.65 | 100 |
| 11                        | 52.58 | 20.62 | 18.56 | 8.24 | 100 |
| 12                        | 43.30 | 20.62 | 25.77 | 10.31 | 100 |
| 13                        | 40.22 | 25.77 | 8.24 | 25.77 | 100 |
| 14                        | 25.77 | 30.93 | 39.18 | 7.22 | 100 |
| 15                        | 56.70 | 18.56 | 22.68 | 2.06 | 100 |
| 16                        | 10.31 | 23.71 | 25.77 | 40.21 | 100 |
| 17                        | 13.40 | 20.62 | 26.80 | 39.18 | 100 |
| 18                        | 12.37 | 21.65 | 30.93 | 35.05 | 100 |
| 19                        | 36.08 | 18.56 | 22.68 | 22.68 | 100 |
| 20                        | 22.68 | 21.65 | 29.90 | 25.77 | 100 |
| Overall average ($)       | 31   | 24   | 28   | 17   | 100 |

Based on research data if grouped based on aspects of students "readiness" and “confidence” are presented in the following Table 3:

| No. | Aspects of Risk Taking | Indicator | Average Sample Answer Options |
|-----|------------------------|-----------|--------------------------------|
|     |                        |           | ALW | OFT | SMT | NVR |
| 1   | Readiness              | a. Careful in act | 31.55 | 28.25 | 29.89 | 10.31 |
|     |                        | b. Peace of mind | 40.21 | 22.47 | 20.82 | 16.50 |
|     | Overall average        |            | 35.88 | 25.36 | 25.36 | 26.81 |
| 2   | Confidence             | a. Be firm in making decisions | 19.18 | 24.12 | 32.37 | 24.33 |
|     |                        | b. Confident in act | 33.81 | 23.09 | 28.04 | 15.06 |
|     | Overall average        |            | 52.99 | 47.21 | .60.41 | 39.39 |

Based on the data in table 3, if described in the form of histogram as follows Figure 3(a) and 3(b):
Based on the results of the study when compared between readiness and confidence are presented in the following Figure 4:

![Graphs](image)

**Figure 3.** Indicators of Risk Taking Chart (a) Aspect of Risk Taking on Readiness, (b) Aspect of Risk Taking on Confidence

**Figure 4.** Summary Aspect of Risk Taking (Readiness and Confidence)

### 3.2. Discussion

After taking into account the data obtained from the research results, the risk taking aspect of "readiness" on careful indicators in the act can be expressed that the 7th grade students of MTs as the sample who chose the option ALW and OFT has reached 59.8%, this means nearly 60% of students already have a cautious attitude when will do actions related to learning mathematics. This careful attitude is shown by the readiness of students in preparing school supplies, doing chores or homework, and other preparations. This attitude of caution is one of the attitudes to reduce errors that will have negative risks (such as the teacher's punishment for negligence or negligence of the teacher's duties).

But still found 40.20% of students who are not or less carefully in action by choosing the option SMT and NVR. Have no readiness in facing learning activities. When studying in the classroom will be borrowed a lot of goods (stationery, even books) from a friend who is ready. If not lent he will interfere with his friend by taking forcibly. Even if not lent he did not learn but chatted aloud. Students like this do not think about the negative risks that will be faced, or even do not care about the negative risks that will be accepted because of negligence. The attitude of students who do not have readiness is what will hinder the teacher in achieving mastery learning which is called the minimum mastery criteria (KKM). And also will disturb other friends who are ready to learn. If not guided by the teacher then he will be a student who fails in math lessons.

Questionnaire on the aspect of "readiness" risk taking for the indicators of peace of mind that choose ALW and OFT obtained 62.68% students have been able to think calmly in learning mathematics. Steps...
to find information or ask for information on the problems faced have been done. But still must be in further detail whether the steps taken in thinking the solution is correct. There are 37.32% of students who choose SMT and NVR show have not been able to think calmly. Students like this are always hesitant in doing tasks or solving problems assigned by teachers. No attempt to find information or troubleshooting steps. And in the end students who do not have peace of mind do not do the job or cheat the work of friends.

Questionnaire which is the aspect of "confidence" risk taking on the firm indicator in making the decision, students who answered ALW and OFT obtained 43.30%. This means that as many as 43.30% of students have been able to decide what to do with all the consequences. Decisions they take will not be regretted even if ultimately wrong or get a low score. A sense of self-confidence and independence has arisen in these students. But it still needs to be closely watched and observed further whether the decisions they take arise from themselves or just follow friends. While those who answered SMT and NVR as many as 56.70% of students, it shows still high students who have not been able to decide what will be done. Students like this are always hesitant in deciding what to do, less independent and not confident. Generally students like this will rely on the closest friends. And in the end a student who does not have the courage to decide what to do will only be an imitator, his wrong friend will be wrong, even if he is right. But, he does not understand it.

Questionnaire which is the aspect of risk taking ‘belief’ on the indicator in action, students who answered ALW and OFT obtained 56.90%. This means the students’ stance is high, in the settlement step, even if it is different from the work of a friend. This belief that will lead the students to succeed in learning. But it still needs to be closely examined and observed whether the sharpness or steady acting they have considered either bad, or just stubborn and careless attitude.

While the answer SMT and NVR as much as 43.10% of students, it shows still high enough students who are not sure or steady in completing the task in math lessons. Always hesitate and change the results of his work if different from friends. Students like this, will always be vacillated with the environment and circumstances.

4. Conclusion

From the results of this study can be concluded that, there are many students of grade 7 MTs, who have not been able to determine the steps to minimize the risks received. The risks received tend to be negative. Overall students who chose not ready answers are still higher than those that are often ready and sometimes ready. Differences of students who are always ready with the never ready only 9.07%. Based on this, teachers and parents should always remind and guide students to be ready for mathematics lessons, beginning to prepare school supplies at night until the time of the teaching and learning process in the classroom.

In addition to the readiness, the aspect of confidence is mainly self-confident and self-confident students of grade 7 MTs. Who answered always despite reaching almost 53% but still lower than the answer sometimes. And the overall difference with the chosen answer is never 21.09%. This shows the attitude of risk taking on the aspect of readiness is higher than the aspect of belief. This means that most students actually already understand and make preparations for facing math lessons tomorrow. However if compared with confidence still lower. So it must be reminded, guided, and supervised by teachers and parents. Not yet independent, still full of doubt in deciding solving math problems.

This risk-taking attitude can be trained with habituation, both at home and at school, with direction, guidance and supervision from teachers and parents. Then the process of building and improving the attitude of risk taking will be more successful. Beginning with parents at home, should regularly remind and supervise the preparation and completeness of their children's schooling at the early age of the school (Play Ground). This habit will make them more independent, more confident tiered next. Parents at home should work with teachers at school. Teachers should regularly train students to be sure of the choice of problem solving math problems, do not hesitate even if different from the work of his friend. And cultivate beliefs never fear being wrong in doing something that is already believed.
These habits will build the character of a young generation who is full of preparation, confident and independent with whatever it does. Never hesitate to decide something, because it is considering good and bad risks to be faced. If they become leaders, they will become confident leaders, not easily affected by incitement and uncertain promises. Very responsible for the task, rights and obligations. This young generation is expected to be the leader of the nation's successor ideals, and who can safeguard and advance the life of the nation.

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