

Mathematic Perception In *Whatsapp* Group Interaction Teacher Participant PPG UHAMKA Year 2020

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Abstract

This descriptive qualitative research aims to see the mathematical perceptions of the teachers participating in the 2020 PPG Daljab UHAMKA after being given the question "Look for three numbers whose total is 10 and the product of all three is an odd number". A total of 57 teachers from 2 PPG classes were given questions through the WhatsApp group which is directly responded by the teacher and the researcher responds until they get the right answer. Each of the teachers who got the correct answers and did not get the correct answers were interviewed to get information related to their perceptions. The results showed that the teacher had the perception that the 3 numbers must be whole numbers, so they never got the answer. Two teachers perceive that it cannot be integers, so they use fractions and decimals. No teacher has come up with an argument for why all three are integers. No teacher has ever performed the deduction process for the addition and multiplication of odd and even numbers. Even though this is an argument why this question cannot be answered.

Keywords: *Mathematical Perception, PPG Participant Teachers, odd-Even Numbers*

INTRODUCTION

Mandate UU Numbers 14 of 2005 concerning Teachers and Lecturers Article 8 states that teachers are required to have academic qualifications, competencies, teacher certificates, are physically and mentally healthy, and have the ability to realize the goals of national education. The Professional Teacher Education Program (PPG) in Position is one of the policies of the Ministry of Education and Culture to complete and complete teacher certification in office. PPG setin PP No. 19 In 2017, Education Minister No. 37 Year 2017, and Permenristekdikti No. 55 of 2017. PPG conducts deepening of academic materials (pedagogic and professional-TPACK), workshops (development of learning tools, *peerteaching*, and PTK proposals), and PPL (GTK DIKDAS, 2019).

Perception is a response (acceptance) directly from something; the process of a person knowing things through their five senses; or process memillih, organize and interpret information about s ice ne (KBBI and; Novianti et al., 2018). Perception is the process to make sense of the information received and acceptance by teachers are not all optimally from on interest, aptitude, motivation, stigma, schemata of individual teachers. Most Indonesian language teachers have used a scientific approach in the 2013 Curriculum (Yanti et al., 2018). P ersepsi is a tendency to see the same event in different ways. P ersepsi student teachers, to children with special

needs, will largely determine its readiness to teach the crew of the (Ward, 2020). Of course, something in this research is mathematics and that someone is a teacher participating in PPG SD Daljab UHAMKA in 2020. So mathematical perception is the response of PPG participant teachers to the mathematical information they get through their senses.

Information about math given by the researchers "find three numbers which add 10 and the product of the three is an odd number." This question is presented through the *WhastApp* group, where PPG participants answer directly to get responses from other researchers and teachers until they get the right answer. This is related to the intensity of communication seen through frequency, duration, and content (Gifary & Nurhayati, 2015). The use of whatsapp is an application of the *TPACK* approach in PPG learning activities, which combines material, pedagogy and technology (Irmita & Atun, 2017; Nevrita et al., 2020; Restiana, 2018). Mathematics teachers in Banten have high CK and TK averages but the *TPACK* is still low (Restiana, 2018). Therefore, it is necessary to use *TPACK* more intensively in learning in schools, especially during the Covid-19 pandemic like this.

The use of group *whatsapp* for PPG Daljab 2020 made online full, so the interaction with teachers conducted by PPG LMS group Kemdikbud and *whatsapp*. Because WhatsApp is the most widely used by people today (Trisnani, 2017). This application has the full feature, fast, easy to operate, practical, and inexpensive, one of which is fitur chat (*chat*) in the group (Anjani et al., 2018; Mubarok et al., 2019; Sukrillah et al., 2017; Suryadi et al., 2018; Trisnani, 2017; Utomo&Ubaidillah, 2018; Wulandari, 2016). Fitur group *whatsapp* considered ideal to use as a means of student discussion and dissemination of academic information in universities (Sukrillah et al., 2017). *Whatsapp* group as a medium for delivering information, a means of discussion and education, entertainment, and delivery of policies (Mubarok et al., 2019; Sukrillah et al., 2017; Suryadi et al., 2018; Trisnani, 2017).

Several studies on the use of group *whatsapp* melaporkan that activity teacher group members *whatsapp* in the category of active and passive (Mubarok et al., 2019). Students are easier to communicate, coordinate, and discussions through *whatsapp* so that the positive effect on the learning outcomes of their (Utomo & Ubaidullah, 2018). Whatsapp can increase the effectiveness of employee performance (Anjani et al., 2018). Pengajar and students utilize *whatsapp* as a medium capable of interacting langsung to lectures (Sukrillah et al., 2017). The use of jargon by community *chatting whatsapp* grup Air functionality to facilitate communication in the midst of the many tasks and lectures, as well as increase familiarity among students so that the students' pep (Wulandari, 2016). Community leaders utilize *whatsapp* as a medium to convey the message (environmental security, social cohesion, education, welfare, employment, and entertainment) that is more effective and faster (Trisnani, 2017). These studies are relevant to the learning activities followed by the teacher during the PPG Daljab UHAMKA 2020.

Teachers need to gain exposure to certain knowledge, perceptions, and skills so that they have a high level of knowledge, perception and willingness to realize effective learning. Perception and readiness of teachers is a predictor factor in the practice of the application of critical thinking skills in learning matematika in school (Ismail et al., 2019). Good perceptions about mathematics lessons and learning make teachers able to carry out mathematics learning in their class well. If you like maths, then teaching it will be easy and fun. Teachers' perceptions and

readiness are very important for the planning, preparation and management of various direct or practical activities that can generate and encourage CTS and constructively among students (Ismail et al., 2019). Teacher perceptions in the teacher guidance module in designing mathematics assessment instruments based on solving math problems are positive (Kurniawan et al., 2019). Persepsi and preschool teacher candidates planning skills assessed as indicators of the performance of teachers (Dunekacke et al., 2016). A total of 40 students prospective teachers have the perception that children with special needs can attend school in inclusive schools, and will be successful. This is due to adjustments to the curriculum, teaching methods, assessments and facilities for students with special needs (Wardhani, 2020). Teacher candidates feel quite prepared to teach mathematics and are indifferent in their perceptions of their ability to integrate mathematical concepts (Rosas & West, 2011). Even though a teacher has been teaching mathematics for a long time, even if he is good at learning, it does not necessarily mean that he has a positive perception of mathematics. Factors that may influence perceptions of prospective teachers of mathematics teaching practices in the period ahead is their learning experiences in the past or preparatory program that they experienced when this (Marjanovich, 2016). Persepsi teachers correlated with the achievement of competence, good knowledge of mathematics or pedagogical content knowledge (Muñiz-Rodríguez et al., 2020). Teachers' perceptions are related to teachers' professional and pedagogical competence. This is in line with PPG learning activities related to deepening of material and *TPACK*.

Aspek is important for fostering children's math competence and should be based on knowledge of math content as well as knowledge of the pedagogical content of early childhood teacher candidates. A total of 354 prospective early childhood teachers were surveyed and subjected to tests and video-based assessments of their math anxiety, knowledge and perceptions of math-related situations. The results show a significant indirect effect of math anxiety on mathematics-related perceptions, mediated by knowledge. The discussion of the results of this study is related to the training of early childhood teachers in Germany (Jenßen et al., 2020). A total of 62 elementary school teacher candidates who took the mathematics method course were asked to "draw mathematics" at the beginning and end of the semester. These images are used to check initial perceptions and how they change at the end of the semester after and the course and field experience (PPL). These pictures help explain the prospective teacher's mathematical vision before and after exploring teaching methods and applying this method to primary school students during PPL. This study provides insight into experiences and images that link prospective teachers with positive and negative emotions towards mathematics. The students' rich dialogue about pictures led to teacher reflections on how their emotions, attitudes, and experiences influenced the way they taught mathematics to students (Burton, 2012). The research is in line with the PPG program in deepening elementary mathematics material learning activities, developing mathematics learning tools, and PPL. A total of 95 prospective elementary school teachers attended the math content course. Prospective teachers who have confidence in their ability to teach mathematics tend to have confidence in solving math problems, the effectiveness of teaching mathematics, and mathematics *self-efficacy* (Briley, 2012). The research is in line with the PPG program in learning activities for deepening elementary mathematics material.

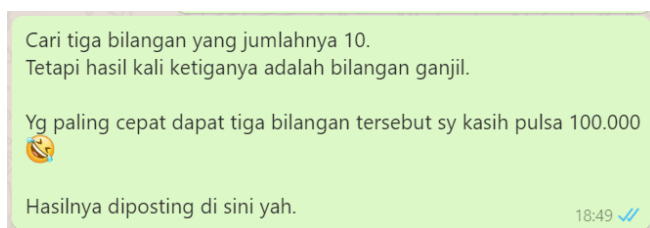
How do teachers perceive student learning difficulties and teacher practices in diagnosing student learning difficulties. It turned out that the teachers did not make an in-depth diagnosis of student difficulties in learning mathematics. They do not thoroughly identify students' thought processes with respect to the mathematical concepts they are learning (Wijaya et al., 2019). This research is in line with the PPG program in PPL activities with the implementation of the PTK cycle. Initial training for prospective teachers and math teachers use *GeoGebra* in Spain before getting certified to enter the profession, by asking ourselves about the mathematical knowledge of what they should have and what it takes to teach mathematics. The use of technology is the key to generating and demonstrating understanding of mathematics and its learning (Hernández et al., 2020). This research is in line with the PPG Daljab Program which is carried out online, starting from the in-depth study of the material to PPL. Here technology is fully used both as a learning tool for virtual eyesight, as well as in supporting the understanding of learning materials and assessment- *TPACK*.

METHOD

The study population was 570 teachers participating in PPG SD Daljab UHAMKA in 2020. Purposive samples were taken in class 05 stage 1 (26 teachers) and 02 stage 2 (31 teachers). The research took place during August and September 2020. The type of this research is descriptive qualitative (Wahyuningsih & Pujiastuti, 2020; Wulandari, 2016). The data collection techniques used were tests, observation, interviews, and documentation (Dike & Yuniarta, 2020; Wulandari, 2016). Observations were made with the active participation of the researcher when the *whatsapp* group chat was taking place through written and pictorial communication. Data taken through the test with higher level thinking questions given by the group *whatsapp* participants PPG Daljab UHAMKA 2020, the observation results of group *obrolan whatsapp*, interview respondents who represent the kind of answer from matter, and documentation respondents through photos and screenshots *whatsapp*. A Nalis is the data carried by describing the data from respondents in the form of data reduction, presentation of the results of tests, interviews, documentation, and concluding with the triangulation method (Arikunto, 2013; Dike & Yuniarta, 2020; Sugiyono, 2015; Ward, 2020; Wulandari, 2016).

RESULTS AND DISCUSSION

On the date of August 29, 2020, at 18:49 to the group *whatsapp* containing 26 g uru participants PPG-SD 2020 UHAMKA grade 05, step 1 and September 14 at 20:24 to the group *whatsapp* containing 31 g uru grade 02, step 2 is given about "Find three numbers that add up to 10. But the product of these three is an odd number"



The teachers who responded and responses to the questions and answers that appear in columns *chat group whatsapp* can be seen in the following diagram.

These three provisions have never occurred to respondents, they are only accustomed to number operations, not number type operations (odd and even) in general. In connection with provisions

like this, they stated that (1) never saw, (2) never heard, (3) never read in books, (4) never conveyed to their students during learning. Even though this is a normal thing, only by generalizing the conditions of several numbers being operated.

In one group *whatsapp chat* session related to the questions given there can be 0.46 interactions per minute and 3.21 interactions per teachers. Based on the table, the types of teacher responses in the group *whatsapp chat* can be grouped as follows.

- Mathematical sentences that are relevant to the problem
- Sentences or words about feelings related to the questions given
- Praise the correct answer

A total of 13 emotikon that appears 🤔😄🙏♀️😄🙏😄🙏😄🙏👍👏🤔😄🙏🚩, which can be categorized with a smile, a laugh, confused, embarrassed, me give up, and praise. Based on the interview, the following key words were obtained regarding PPG at UHAMKA in 2020. So far, the implementation of PPG UHAMKA has always received very good assessments from the Directorate of GTK of the Ministry of Education and Culture. Likewise with the testimony of PPG participants (Astuti, 2020).

Chat Teacher Whatsapp Interaction

- a. Interaction through *chat whatsapp* guru PPG Daljab t AHAP 1 k elas 05
As many as 16 out of 26 teachers in the *WhatsApp* group provided answers and responses to the questions the researcher gave. From the result of research interactions, there were 10 teachers who gave answers, 11 teachers gave responses, and 3 teachers gave feedback. Teacher R1 gave the answer 3 times, got 1 response 2 times, and responded back 5 times. Teachers R2, R3, and R5 gave 2 responses. The R1 teacher who managed to give the correct answer.
- b. Interaction through *chat whatsapp* teacher Daljab PPG stage 2 class 02
Based on the interaction table, there were 67 interactions, 10 teachers gave answers and responses, and 3 teachers gave feedback. Guru R18 at most give answers and receive responses, R 2 2 at most provide feedback, and R17, R18 at most provide feedback. The R19 teacher who managed to give the correct answer. Based on the two *WhatsApp* groups *chat*, the following types of interactions are obtained.

Results of interviews with WA ririskiky a private to a respondent who managed to get three numbers in question and who have not been successful. This is the old problem Look for three numbers that are 10. But the third time is an odd number. What did you think for the first time you saw a problem like this? Thank you The answer can be in JAPRI to sy .

[07:25, 7/7/2020] R8 : Good morning sir, I'm R8 . I'll try to answer.

The first thing I thought when I saw the problem was which type of number should I use to calculate, whether it was a regular integer or something else. However, because I am used to numbers 1-10 are ordinary integers, therefore I started to count the 3 possible numbers which add up to 10 and multiply the odd number. Until finally I realized that ordinary integers cannot produce anything like that, neither positive nor negative. For that at that time I used a combination of fractions which I thought were made into a decimal the result was an odd number. In my opinion, the result is an odd number, but it turns out that after seeing the correct answer I just realized that what was asked was an odd number and if I'm not mistaken the odd numbers don't apply to decimals. That's all sir, thank you.

[07:25, 7/7/2020] Wahidin mtk: Ready

[07:25, 07/09/2020] R8 : You are welcome 🙏

Key sentences that appear:

- 1) Number type to use, whole number or something else.
 - 2) S already familiar with integers $\{1, 2, 3, \dots, 10\}$ so try out various possibilities. But realized that he could not produce the question asked. Likewise for negative integers. The mathematical perception that arises is that when talking about integers, it is always 1, 2, 3, ... It is very rare to see 0 and negative numbers such as 0, -1, -2, -3,
 - 3) M uses a variation with a fraction whose result is a decimal, and is considered an odd number. Respondents think odd numbers also apply to decimals. Namely $3/10 + 7/10 + 9 = 10$ and $3/10 \times 7/10 \times 9 = 189/100 = 1.89$ is considered odd because it ends in 9. This is the teacher's perception that the decimal number is also classified as odd and even, simply because it ends with an odd or even number behind a comma. Even though the universe of odd and even numbers is an integer.
- [07:39, 7/7/2020] R1 : Assalamualaikum warahmatullahi wabarakatuh. I'm R1, sir. Regarding the answer to the mtk question that bpk gave first, what occurred to me was to find 3 numbers which when added together the result is 10 and if these 3 numbers are multiplied, it will produce an odd number. So I tried to change the 3 numbers, but it always produces an even number when multiplied. I tried it with a domed number, but the result was a decimal number too. Finally succeeded in getting odd numbers. So sir. Thank you

[07:40, 7/7/2020] Wahidin_mtk: ready to max

Key sentences that appear:

- 1) Trying tamper - tamper with the number 3, but always produces an even number when multiplied
 $2, 3, 5$; the number is 10 but the product is even.
 $1, 3, 7$; odd product but not 10.
 Teacher R1 mentioned numbers, it should be numbers here, because numbers are different from numbers, numbers are numeric symbols, and what can be operated is numbers not numbers. This is also a mathematical perception, namely calling numbers for numbers.
- 2) Using domed numbers, but the result is still a decimal
 $3,3 + 3,3 + 3,4 = 10$ and $3,3 \times 3,3 \times 3,4 = 37$
 which should be 37,026
 Apparently the respondent rounded it up to 37, so it is seen as an odd number. There should be no concept of rounding to get an odd or even number, because the universe is an integer. This becomes the teacher's mathematical perception that decimal numbers are rounded to odd numbers. Another perception is to say the number is 'domiciled', when it should be a decimal number. Most of us will also mention decimal numbers with decimal fractions, even though fractions are different from decimal numbers. This is also mathematical perception.
- 3) get results time peculiar to $2.5 + 3.5 + 4 = 10$ and $2.5 \times 3.5 \times 4 = 35$.

CONCLUSIONS AND SUGGESTION

Based on the results of research and discussion, it can be concluded that some of the mathematical perceptions of the PPG participating teachers in UHAMKA 2020 are as follows.,

Numbers can represent numbers, Column numbers as decimal numbers, Odd-even numbers in decimal numbers, Rounding off a decimal number can be an odd number, The strategy for solving this problem is by trial and error, The answer must be 3 integers, Unable to provide an argument for why no 3 integers satisfy, Not once did the process of deduction operation on odd-even, many teachers already perceive 5 3 numbers among fractions or decimals, but only two people who get the answer, Integers are 1, 2, 3, ..., 10 and so on.

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