Kaunia, Vol.XVII, Num.1, April 2021, pp. 1~5
ISSN 1829-5266 (paper), ISSN 2301-8550 (online)
Available online at http://ejournal.uin-suka.ac.id/saintek/kaunia

Mathematics learning during pandemic COVID-19 at Junior High School in Bukittinggi-Agam

Pipit Firmanti

Mathematics Education, IAIN Bukittingi
Corresponding author: firmantiyuberta@gmail.com

Abstract

The COVID-19 has become epidemic in the world at the end of 2019. It has impacted all sectors including education. The learning process that initially took place in the school has now been switched virtually. However, this worsens the students understanding in learning mathematics because previously they found it difficulties even in offline learning activities. Describing the learning proces during this pandemic condition is necesary and important to cope with this problem. The problems during this pandemic are related to three domains, namely cognitive, affective and psychomotor. Therefore, a research about this should be conducted. The method was qualitative research by interview and questionnaire. The participants were ten teachers and ten students from different junior high schools in Bukittinggi and Agam. From cognitive aspect, the result found that students could more easily understand the subject matter delivered by the teacher before the pandemic; the percentage of students' understanding of the material learning decreased by 10% during pandemic. From psycomotor aspect, teachers rarely use instructional media during the online learning process; The use of learning media also decreased by 60%, but the percentage of using online media as a learning resource increased by 50%. Moreover, the difficulty of using learning media for student increased by 40%. From affective aspect, teachers are more flexible in giving punishment to students who are not disciplined and educate students' behaviors before pandemic than during the online learning process. Teacher gives punishment for students who were not disciplined decreased by 50% after virtual class. Overall, assessment done by teacher tends to the cognitive aspects during pandemic.

***Keywords**: mathematics learning, Covid-19, online learning process.*

Introduction

A curriculum has learning tools and educational programs to be given to students in one period of education level. The curriculum design takes into account the conditions and abilities of students in the field of study. The COVID-19 condition also affects the current curriculum. Moreover, this virus is spreading very quickly to various countries (Nadeem, 2020). On March 11, 2020, the World Health Organization (WHO) declared the Corona virus as global pandemic (Cucinotta & Vanelli, 2020). At this time, the virus has also plagued Indonesia.

Mathematics learning, which usually takes place in the classroom, now has to be learned virtually. In general, schools implement the 2013 curriculum which was revised before the current situation changes education system. This curriculum focuses on the acquisition of certain competencies by students. In this case, competence is defined as knowledge, skills and abilities that are controlled by someone who has become part of him so that he can perform cognitive, affective and psychomotor behavior as well as possible. (Mulyasa: 2013).

The learning process is actually not only emphasized on one aspect but also the balance on the affective, psychomotor and cognitive aspects. The learning process that implements the scientific approach will combine these three aspects. The affective domain uses the transformation of the substance or teaching material so that students "know why". The psychomotor domain of uses the transformation of substance or teaching materials so that students "know how". The cognitive domain uses the transformation of the substance or teaching material so that students "know what" (Julfahnur, et al:)

In addition, the implementation of the 2013 curriculum is expected will produce productive, creative, innovative, and affective generations through strengthening attitudes, skills, and knowledge integration. The 2013 curriculum allows teachers to assess student learning outcomes in the process of achieving learning goals, which reflects mastery and understanding of what is learned. However, after the Covid-19 Pandemic, schools experienced various obstacles and obstacles in implementing this curriculum.

Based on the official letter of the ministry of education and culture No. 3 of 2020 regarding the prevention of the spread of Covid-19 in education units, schools need to consult with local education office whether teaching and learning activities need to be temporarily closed, so that students follow the online learning process (Kemendikbud, 2020). Bukittinggi began to close learning at schools starting on March 19, 2020. Then, on November 19, 2020, they began to do normal activities in school as usual by health protocols. Students do not go to school every day and still implemented online learning. This learning process takes place without direct face to face between teachers and students, but is carried out online using the internet network. Approximately eight months of school students study fully from home.

Most schools implement an emergency curriculum with reduced school hours. This situation affects students' understanding in accepting the material taught by the teacher. The society, especially the parents of students, gave various responses to online mathematics learning. Many of them complain about not being able to act as a good teacher for their children at home.

Therefore, the process of learning mathematics that switches from direct to online learning will create more problems that must be solved. Even though, mathematics had been previously assumed to be a subject feared by students. Mathematics must be taught from concrete to abstract concepts because children's ability to understand material is adjusted to their cognitive development. Based on Piaget's theory of cognitive development there are four stages, namely sensorimotor, preoperational, concrete operations and formal operations. In formal operations, children begin to involve logic reasoning which appears at the age of eleven to fifteen years. In Indonesia, this stage begins to emerge when children enter junior high school.

Before online learning began, students still had difficulties in learning mathematics. This is because mathematics is dominated by abstract concepts that make it difficult for students to understand. Based on research conducted by Indrie on 32 junior high school students in Karawang Regency, it can be seen that 41.18% of male students and 53.33% of female students are just at the initial formal operation stage. While the rest are in the concrete stage (Aini, et al: 2017). The number of students who are in concrete level shows that the mathematics learning process has not been maximized in the classroom. On the other hand, the current online learning process adds to the long list of existing problems.

In addition, research conducted by Gita, et al (2020) on teachers in Jakarta stated that the challenges faced by mathematics teachers were readiness in presenting virtual learning with the constraints of teachers' limitations in using technology and internet access which sucked up quite a lot of quota when using virtual meetings via zoom meeting. The strategy used by the teacher is to make teaching videos related to teaching materials and then distribute them to students through WA groups. It can be seen that unreadiness of teachers in Jakarta of technological usage became new problem.

Based on the description above, researchers would like to describe the mathematics learning process of junior high school students in the Bukittinggi and Agam based on three domain: cognitive, affective and psychomotor.

Research Method

This study uses a qualitative approach. It answers research problems that require an in-depth and thorough understanding of choosen object, to produce conclusions in the context of the time and situation concerned. According to Bogdan and Tylor (Zuriah, 2006, p. 92) that "qualitative research is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior.

The samples in this study were ten teachers and ten students of SMP/MTsN in Bukittinggi and Agam and were taken randomly. Four of them teach in Bukittinggi. Meanwhile, others teach in Agam. This research started from August to November 2020. Data collection was carried out directly in the form of structured interviews by direct and online meeting. An valid Interview guidelines were given to teachers, while closed questionnaires were given to students. There are 20 question items in the interview guidelines.

The forms of interview guidelines are as follows:

Table 1. Interview Guidelines for cognitive Aspect.

Code	Question
A.1	Is the subject matter that you delivered can be understood by students well?
A.2	What are the learning methods or strategies that you use in learning mathematics?
A.3	What are the learning resources that you use in learning mathematics?
A.4	How is the implementation of the Daily Test (UH)? Is the form of the question given an essay or objective?
A.5	What is the standard value (KKM) for student minimum achieved that you take?
A.6	In the final assessment, what is the proportion of the assessment taken from UH, UTS and UAS that you give?
A.7	What are the obstacles that you face in the process of delivering the material?
A.8	What have you done to overcome these obstacles?

ISSN 1829-5266 (paper), ISSN 2301-8550 (online)

Table 2. Interview Guidelines for psychomotor Aspect.

Code	Question
B.1	What media do you use in the learning process?
B.2	What skills of student do you see in the process of learning mathematics?
B.3	How do you assess the psychomotor aspect in learning mathematics?
B.4	What obstacles did you find in assessing students' psychomotor skills?
B.5	What have you done to overcome these obstacles?

Table 3. Interview Guidelines for affective Aspect.

Code	Question
C.1	When is your schedule for teaching math in direct or online class? If you are in online class, what media do you use?
C.2	Is the study schedule in accordance with the scheduled time?
C.3	What kind of reward/punishment do you give if a student commits a violation?
C.4	How do you build positive attitudes and behavior from students during the learning process?
C.5	How do you make an assessment of the affective aspects for student?
C.6	What obstacles did you find in assessing student attitudes and behavior?
C.7	What have you done to overcome these obstacles?

Discussion

The interviews conducted focused on aspects that are in the 2013 curriculum, namely aspects of cognitive, affective and psychomotor. Based on the results of interviews obtained:

In the aspect of cognitive, the overall sample of items no. A3, A5 and A6 did not significantly changes. The learning resources used by teachers are still the same before and after pandemic such as textbooks, teaching materials, LKPD and modules. In general, the standard of completeness taken by each teacher also remains between before and after the pandemic, which is 75. One school whose KKM is different for each grade and two schools take lower KKM. Furthermore, the proportion taken for the assessment also did not change before and after the pandemic, depending on the policies of each school.

Aspect of A1: all respondents stated that it was easier for students to understand the subject matter delivered by the teacher before the pandemic because the process was in the classroom. So that students can directly ask if there is something that is not understood. Meanwhile, after the pandemic, not all of the material can be understood by students, moreover students tend to cheat on their other friends' answers.

Aspect of A2: there is a change in the learning strategy carried out by the teacher. They use a variety of learning models such as cooperative learning, discovery learning, problem-based learning, lectures, questions and answers, discussions, and others. However, during the pandemic, the average teacher uses online media such as whatssup, video call, zoom, etc.

Aspect of A4: Teacher gave examination (UH) directly using objective or essay test. However, during the online class, teachers use google forms in giving exams.

Aspect of A7: The obstacle faced by teachers in delivering material was the lack of student motivation in direct meeting. The students' minds are indoctrinated because mathematics is a difficult subject. During the COVID-19, teachers were unable to explain in detail due to limited time and resources. Teachers also cannot directly identify students who do not understand because they cannot see their facial expressions. Students are also more comfortable asking friends compared to teachers during virtual class. In addition, there are also students who do not study at all.

Aspect of A8: the teacher has tried to overcome these obstacles. In normal situation, teacher suddenly give quiz to the student and change learning methods. In this new normal era, teachers provided teaching materials by creating a tutorial videos and implementing of counseling service.

In the aspect of psychomotor, there are several changes of learning mathematics in two different conditions. **Aspect of B1**, teachers rarely use learning media during the pandemic. The media used by the teacher is dominated by the delivery of learning videos. However, teachers used various teaching tools in normal class.

Aspect of B2: Before the pandemic, teachers noticed a lot of various skills (psychomotor) of student such as performing work, making space, drawing graphs, manipulating skills, and others. For instance, teacher looks at the students' skills in making number lines for integer material. Teacher notice students' skills in making arrow diagrams and Cartesian diagrams for function material. However, after the pandemic, teachers only use portofolios. Assessments also tend to be cognitive only. In addition, the assessment is also carried out by looking at how skilled students are in working on the given questions, for example story questions and seeing the student's discipline in collecting assignments on time.

Aspect of B3: Assessment on these aspects before the pandemic based on competency characteristics and giving written tests to see the accuracy and correctness of the image or graph. However, during online learning it is very difficult to monitor students, about 30% do not do an assessment on this aspect.

Aspect of B4: Some obstacle before the pandemic is limited time to notice student skills. During the pandemic, students are difficult to monitor directly and the collection of assignments is not on time.

Aspect of B5: Teacher provides a discussion of the assignments given to students so that they understand as solution. The teacher also advises and provides enlightenment to students and gives a second chance if students are late in submitting assignments. After pandemic, teachers also called students one by one to school and asking students to send photos of their notes and exercises on private whatsapp to address students' different personalities.

In the aspect affective, **aspects of C1 and C2** tend not to change, namely the teacher has taught according to a predetermined schedule. It's just that the implementation is different. If before the pandemic it was done in class, during the pandemic it was done virtually (zoom, WA, google classroom, etc.). There is one school that has reduced class hours. Teachers who used to teach twice a week, during the pandemic became once a week.

Aspect of C3, before the pandemic, teacher give punishment for students who did not do homework such as doing it or sitting in front of the classroom and memorizing verses. During the online learning process, teacher only told to work on time and complete the assignments. Students with lower level are called. During the pandemic, it is difficult to give punishment, but if you don't practice too much, you will not be allowed to take the exam.

Aspect of C4; the teacher educates positive attitudes of students by recording mistakes at the end of the learning process before the pandemic. Next, prayer and tadarus before studying. There is also the provision of rewards and punishments. The teacher also provides examples and teaches students to help friends with low abilities. However, during the pandemic teachers practice good attitudes of student by submitting assignments on time and their honesty by reminding students through messages.

Aspect of C5; In normal situation, the teacher assess aspects of affective by noticing attention to students' behavior such as style of communicating students to teachers and their friends while at school. There are teachers who use journals and note rubrics. After the pandemic, teachers can only see students by looking at the accuracy in the collection task on time. The communication process takes place online. How do students work to answer the problem. Even though the teacher cannot see the actual behavior of students, the teacher rate from the activity of students greet or answer teacher's question, and provide reports on note in the WA group.

Aspect of C6, The obstacle in assessing student affective before the pandemic was the difficulty when assessing one student at a time because there were too many. After the pandemic, many obstacles were encountered in the completeness of documents and timeliness. In addition, when students are called, they have problems during the pandemic but do not come.

Aspect of C7, Teacher had tried to overcome the obstacles for this aspect before the pandemic can be overcome directly. However, after the pandemic the teacher will usually trace it to his house. Remind students via Japri by giving positive messages.

In addition, the result of questionnare given to students can be seen as follow:

Table 4. The result of questionnaire before and during pandemic.

Aspect	Percentage (%)			
	Before		During	
	Yes	No	Yes	No
A1	60	40	50	50
A3.1	80	20	80	20
A3.2	20	80	70	30
A7	30	70	70	30
B1	80	20	20	80
B4.1	30	50	50	50
B4.2	60	20	20	80
C3	90	10	40	60

Note:
A1 : I can understand the subject matter that the teacher teach well
A3.1 : official books are used as learning resources
A3.2 : Online media is used as a learning resource
A7 : I have difficulty in doing exercise given by teacher
B1 : Teachers use media in the learning process
B4.1 : I find difficult to use learning tools
B4.2 : The teacher guides me in drawing graphs
C3 : The teacher gives punishment to students who are not disciplined

Based on the table above, it was obtained that there was a decrease in students' ability to understand the material presented by the teacher when the pandemic as much as 10%. Then there was a change in the use of online media as a learning resource during the pandemic from 20% to 70%. For the use of learning resource as books was as much as 80%. Students have difficulty working on the questions given by the teacher from 30% to 70% during the pandemic.

In the psychomotor aspect, as many as 80% of students stated that teachers used teaching tools in the learning process, but during the pandemic only 20% of teachers used them. The percentage of students' difficulty in using teaching aids increased by 20%. The teacher guides students in drawing graphs initially as much as 60% down to 20% during the pandemic.

In the affective aspect, the teacher gave punishment for students who were not disciplined initially from 90% down to 40%. This is due to existing limitations.

This shows that students prefer learn in the classroom because teaching materials delivered by the

 ISSN 1829-5266 (paper), ISSN 2301-8550 (online)

teacher are easier to understand. In addition, teachers are also easier to condition and build students' character during directly learning.

Conclusion

Mathematics learning before and during pandemic tends to be different. It can be seen from three aspect. They are:

A. Cognitive aspect

Students are easier to understand the subject matter presented by teacher before pandemic. There has been a change in learning strategies carried out by teachers where previously teachers used varied learning models. However, during the pandemic, the average teacher uses online media. The learning resources used are still the same. During the situation before COVID-19, the teacher gave examination directly such as objective or essay test. However, during the pandemic teachers use Google Forms in giving exams. About 70% of teachers took 75 for KKM. The proportion taken for the assessment also did not change.

The main problem before the pandemic was the lack of student motivation and mindset of student about mathematics which was difficult. New problems arise when the learning process is online because the teacher are not able directly to monitor the learning process. The main cause are limited time, low communication and unclear learning material.

B. Psychomotor aspect

Teachers are less likely to use learning media during Covid-19. They only use portfolios in looking this aspects and discipline in collecting assignments. In other word, the assessment tends to be on the cognitive aspect. Whereas the teacher previously saw a lot of things during the learning process in the classroom such as work demonstrations, making space, drawing graphs, manipulating skills, punctuality in collecting assignments, portfolios and others.

The assessment on psychomotor aspects during online learning is very difficult. Teacher are not able to monitor students. Therefore, 30% among them do not make an assessment on this aspect.

Before COVID-19, teacher was difficult to notice students' skills in detail because of limited time. Therefore, the teacher discuss the right answer of assignments together with students in the classroom. The teacher also advises students and provides a second chance if students are late in submitting assignments. On the other hand, teacher are difficult to monitor students directly during the pandemic. Moreover, many students submit assignments not on time. The teacher calls them privately to go to school.

C. Affective aspect

As many as 90% of teachers who have taught according to a predetermined schedule tend not to change even though during the pandemic. They did it virtually (zoom, WA, google classroom, etc.). The other did a reduction in class hours. Before the pandemic, teachers were more flexible in giving punishment to students who were not disciplined.

The obstacle in doing assessment of affective aspect before the pandemic was the difficulty in assessing one by one student because there were too many. After the pandemic, many obstacles were encountered in the completeness of documents and timeliness. In addition, when naughty students are called, they do not go to school. This can be overcome directly in normal situation. However, after the pandemic the teacher will usually trace it to his house and send the positive.

Based on the analysis of the data above, it can be concluded that the mathematics learning process has changed due to the Covid-19 pandemic. Therefore, teachers as educational facilitators are expected to be able to innovate in learning in the future.

References

Arikunto, Suharsimi. (1989). *Prosedur Penelitian: Suatu Pendekatan Praktik*. Jakarta: Bumi Aksara.

Aini, Indrie Noor & Nita Hidayati. 2017. *Tahap Perkembangan Kognitif Matematika Siswa SMP Kelas VII Berdasarkan Teori Piaget ditinjau dari Perbedaan Jenis Kelamin*. JPPM Vol.10. No.2 (2017). untirta. ac.id

Julfahnur, dkk. *Implementasi Kurikulum 2013 dalam pembelajaran SMA*. Program Studi Pendidikan Bahasa dan Sastra Indonesia Fakultas Sastra, Universitas Muslim Indonesia.

Kencanawaty, Gita, dkk. 2020. *Tantangan dan Strategi Pembelajaran Matematika di Masa Adaptasi Kebiasaan Baru (AKB) dampak dari Covid-19*. Seminar Nasional dan Diskusi Panel Pendidikan Matematika. Proceeding.unindra.ac.id

Kemendikbud.2020. *Surat Edaran Kementerian Pendidikan dan Kebudayaan Direktorat Jenderal Pendidikan Tinggi Nomor 3 Tahun 2020 tentang Pencegahan Penyebaran Covid-19 Pada Satuan Pendidikan*

Mulyasa, 2013. Pengembangan dan Implementasi Kurikulum 2013. Bandung: PT Remaja Rosdakarya

Nadeem, S. (2020). Coronavirus COVID-19: Available Free Literature Provided by Various Companies, Journal and Organizations around the world. Journal of Ongoing Chemical Research, 5(1), 7-13.

Cucinotta, D., & vanelli, M (2020). WHO Declares COVID-19 a Pandemic. Acta Bio-Medica: Atenei Parmensis, 91(1), 157-160

Zuriah, Nurul. (2006). Metodologi Penelitian Sosial dan Pendidikan. Jakarta: PT Bumi Aksara.

THIS PAGE INTENTIONALLY LEFT BLANK