JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

Jurnal Eduscience (JES)

Volume 10, No. 1

April, 2023

Submit : 01 February 2023

Accepted : 5 April 2022

IMPLEMENTATION OF FLIPPED CLASSROOM ON MATHEMATICS LEARNING AT SMP NEGERI 4 TANIMBAR SELATAN, DISTRICT OF TANIMBAR ISLANDS

YOSEPH WATRATAN[1], FRANSINA RANGKOLY[2], MESAK RATUANIK[3]
[1] Afiliasi (Pendidikan Matematika, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Lelemuku Saumlaki)
Alamat e-mail: yopiwatratan93@gail.com

Abstract

This study aims to determine the implementation of the Flipped Classroom model in online mathematics learning at SMP Negeri 4 Tanimbar Selatan. The type of research used in this research is qualitative research. namely exploratory descriptive research which means that researchers want to explore broadly about the causes and effects or things that affect the occurrence of something. The subjects in this study were class VII students of SMP Negeri 4 Tanimbar Selatan, totaling 18 students. The research instruments used in this study were: a) observation Observation aims to observe the effectiveness of student learning in learning mathematics online counting operations material by implementing the Flipped Classroom model, b) interview sheets are used to obtain information related to the effectiveness of learning mathematics material. operation of counting integers online by implementing the Flipped Classroom model c) Tests The test sheets in this study were given to students after being given mathematics lessons with learning videos that had been prepared by researchers to start learning in class. The results of this study indicate that applying the flipped classroom model can overcome problems in the face-to-face learning process and can improve student learning outcomes. This can be seen from the results of the final test of students who take part in the learning process because they feel happy when discussing in groups because they exchange ideas, help each other and freely ask for help from educators when experiencing difficultie.

Keywords: *Flipped Classroom, Math Learning.*

Abstrak

Penelitian ini bertujuan untuk mengetahui implementasi model Flipped Classroom pada pembelajaran matematika secara daring di SMP Negeri 4 Tanimbar Selatan. Jenis penelitian yang digunakan dalam penelitian ini adalah penelitian kualitatif. yaitu penelitian deskriptif eksploratif yang berarti bahwa peneliti ingin menggali secara luas tentang sebab-akibat atau hal-hal yang mempengaruhi terjadinya sesuatu. Subjek dalam penelitian ini adalah siswa kelas VII SMP Negeri 4 Tanimbar Selatan yang berjumlah 18 siswa. Instrumen penelitian yang digunakan dalam penelitian ini adalah: a) observasi Observasi bertujuan untuk mengamati efektivitas belajar siswa dalam pembelajaran matematika materi operasi hitung bilangan bulat secara daring dengan mengimplementasikan model Flipped Classroom, b) lembar wawancara digunakan untuk mendapatkan informasi yang berkaitan dengan efektivitas pembelajaran matematika materi operasi hitung bilangan bulat secara daring dengan mengimplementasikan model Flipped Classroom c) Tes Lembar tes dalam penelitian ini diberikan kepada siswasesudahdiberikan pembelajaranmatematika dengan video pembelajaran yang sudah disiapkan oleh peneliti untuk memulai pembelajaran di kelas. Hasil penelitian ini menunjukan bahwa bahwa dengan menerapkan model flipped classroom dapat mengatasi masalah terhadap proses pembelajaran tatap muka dan dapat meningkatkan hasil belajar siswa. Hal ini dilihat dari hasil tes akhir siswa yang mengikuti proses pembelajaran dikarenakan merasa senang saat berdiskusi dalam kelompok karena mereka bertukar pikiran, saling membantu dan secara bebas meminta bantuan dari pendidik saat mengalami kesulitan.

Kata Kunci: Flipped Classroom, Pembelajaran Matematika

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

INTRODUCTION

Flipped classroom is a learning approach that can be used to improve the important skills needed by students. In learning mathematics, this approach is considered to be able to develop higher-order thinking skills (Efendi & Maskar, 2020). Advances in technology are increasingly rapidly demanding education to continue to develop and be able to produce high-quality human resources (HR) who are able to think critically, creatively, systematically, are able to solve problems, and have good morals. Critical thinking skills are very important to have, because critical thinking can be used to solve problems and as a consideration in making the right decisions. To overcome these challenges, innovative strategies and appropriate support systems are needed to increase the positive impact of implementing a flipped classroom (Walidah et al., 2020). Based on the results of an interview with a student at SMP Negeri 4 South Tanimbar in the 2020/2121 Academic Year, the researchers obtained information that the student had difficulty understanding mathematics learning on integer operations material. The cause of learning difficulties experienced by these students was face-to-face learning in limited classes and the teacher only gave independent assignments for students so that learning motivation was reduced. Students experience difficulties in completing assignments given by the teacher. After the researchers conducted interviews and discussions with Ms. Marisa Batlayeri, S.Sc., M.Pd who is a mathematics teacher at SMP Negeri 4 Tanimbar Selatan, on Monday 11 January 2021. Information was obtained that online learning had not been implemented, student motivation was low and teachers have not utilized technology in the learning process. Teachers only use study groups at home to distribute teaching materials and independent assignments in the form of modules. So that online learning in the midst of the Covid 19 pandemic is a big challenge for students of SMP Negeri 4 South Tanimbar. So the school is looking for a solution to anticipate this. While some students also don't have cellphones so they can only do learning in groups, where they do learning activities together. Mathematics teachers at SMP Negeri 4 South Tanimbar find it difficult to deal with online learning because of the family economy. Because some students at SMP Negeri 4 Tanibar Selatan do not have mobile phones, the steps taken by the mathematics teacher can only distribute students in groups with less than 6 members. So that students who don't have cell phones can collaborate in group learning at home.

So the school is looking for a solution to anticipate this. While some students also don't have cellphones so they can only do learning in groups, where they do learning activities together. Mathematics teachers at SMP Negeri 4 South Tanimbar find it difficult to deal with online learning because of the family economy. Because some students at SMP Negeri 4 Tanibar Selatan do not have mobile phones, the mathematics teacher can only distribute students in groups with less than 6

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

members. So that students who don't have cell phones can collaborate in group learning at home. The process of learning mathematics is an activity that contains a series of teacher and student preparations based on reciprocal relationships that take place in educational situations to achieve certain goals (Ratuanik & Feninlambir, 2022). Mathematical objects are abstract, so learning mathematics requires a high level of reasoning so that in the face of the Covid 19 pandemic learning mathematics must be implemented in the application of the Flipped Classroom model to access the effectiveness of students and teachers in learning mathematics online. So that researchers are interested in conducting research with the title: "Implementation of Flipped Classroom in Online Mathematics Learning at SMP Negeri 4 South Tanimbar, Tanimbar Islands Regency."

RESEARCH METHODS

The type of research used in this research is descriptive exploratory which means that the researcher wants to explore broadly about causes and effects or things that influence the occurrence of something. According to (Ratuanik & Feninlambir, 2022), Qualitative research is "a research process that produces descriptive data in the form of human speech or writing and observed behavior". This research was conducted at SMP Negeri 4 Tanimbar Selatan in Wowonda Village, Tanimbar Islands Regency. The instruments used in this study were a) observation Observation aimed at observing the effectiveness of student learning in learning mathematics on integer arithmetic operations material online by implementing the Flipped Classroom model, b) interview sheets were used to obtain information relating to the effectiveness of learning mathematics on arithmetic operations material integers online by implementing the Flipped Classroom model c) Tests The test sheets in this study were given to students after being given mathematics lessons with learning videos that had been prepared by the researchers to start learning in class. This test sheet is used as a tool to find out how students' mathematical problem solving abilities are in solving problems. Before being given to students, the test will be tested and validated first. . Qualitative data analysis, namely analysis of student work results, student response questionnaires and implementation of learning activities used qualitative analysis.

The following can be presented in the form of a research flowchart:

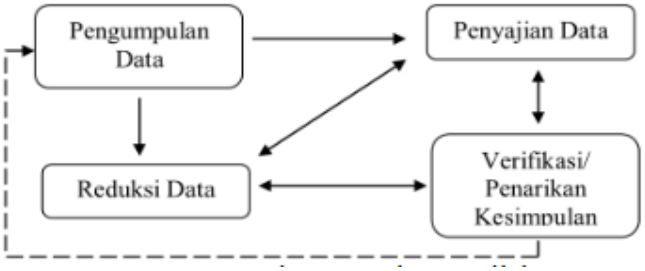

Figure 1. Research Flow

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

RESULTS AND DISCUSSION

In this section, a description of student test results will be presented which was attended by 13 students. The description of the test results is grouped based on the highest and lowest total scores. The highest scores were selected by 3 students with the highest scores and 2 students with the lowest scores were selected which were then used as subjects in this study consisting of subject 1, subject 2, subject 3, subject 4 and subject 5 and each will be described. The following are the answers of the research subjects:

a. Subject 1 A L

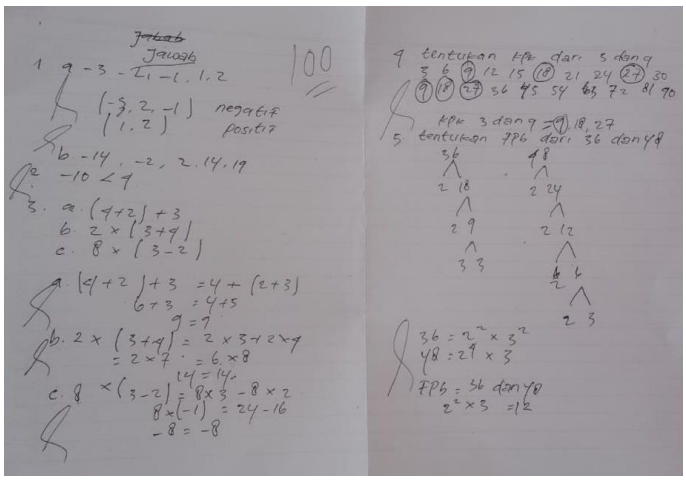

Figure 2. Subject Answers 1

Based on Figure 2. The results of subject 1's answers obtained that in determining positive and negative integers, namely -3,-2,-1. 1 and 2 it can be seen that students have been able to determine negative numbers and positive numbers by answering the negative numbers are -3,-2 and -1 while the positive numbers are 1 and 2. Then in part b, namely $-14, -2, 2, 14$ and 19. In question number 2, which is about comparison, subject 1 is able to compare by placing signs/symbols to compare numbers, namely the sign is smaller or less than, subject 1 answers -10<4. In question number 2, it is given about addition and subtraction of integers using the properties of number operations. Subject 1 determines the sum at point a, namely $(4 + 2) + 3 = 4 + (2 + 3)$ and the result is equal to 9 on the left and right sides. For point b, Subject 1 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 1 writes $2\times(3+4)=2\times3+2\times4$ which results equal to 14 in left side and right side. For point c, Subject 1 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 1 writes $8 \times (3 - 2) = 8 \times 3 - 8 \times 2$ which has the same result as -8 on the left and right side. Next to determine the KPK and FPB. Subject 1 was able to determine the LCM of 3 and 9, namely 9,

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

18 and 27. Meanwhile for question number 5 to determine the GPA of 36 and 48, Subject 1 used the factor tree method to determine the GPA so that the GPA of 36 and 48 was 12.

b. Subject 2 B F

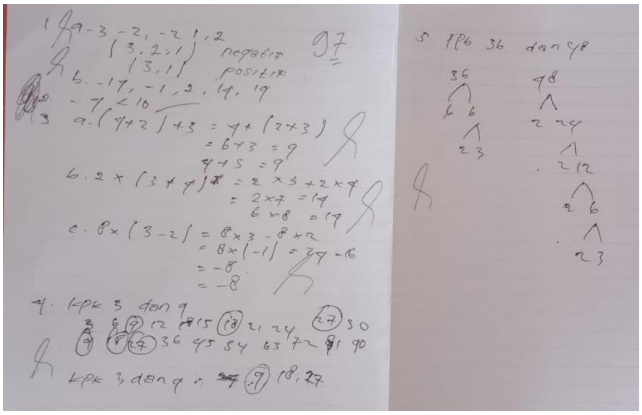

Figure 3. Subject Answers 2

Based on Figure 3. The results of subject 2's answers obtained that in determining positive and negative integers, namely $-3, -2, -1$. 1 and 2 it can be seen that students have been able to determine negative numbers and positive numbers by answering the negative numbers are -3,-2 and -1 while the positive numbers are 1 and 2. Then in part b, namely $-14, -2, 2, 14$ and 19. In question number 2 which is about comparison, subject 2 has not been able to compare by placing signs/symbols to compare numbers, namely the greater sign, so subject 2 answers -10>4. In question number 2, it is given about addition and subtraction of integers using the properties of number operations. Subject 2 determines the sum at point a, namely $(4 + 2) + 3 = 4 + (2 + 3)$ and the result is equal to 9 on the left and right sides. For point b, Subject 2 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 2 writes $2 \times (3 + 4) = 2 \times 3 + 2 \times 4$ which results equal to 14 in left side and right side. For point c, Subject 2 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 2 writes $8 \times (3 - 2) = 8 \times 3 - 8 \times 2$ which results equal to -8 on the left and right side. Next to determine the KPK and FPB. Subject 2 was able to determine the LCM from 3 and 9, namely 9, 18 and 27. As for question number 5, to determine the GPA of 36 and 48, Subject 2 used the factor tree method to determine the GPA so that they obtained the GPA of 36 and 48 but had not yet determined the results.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

c. Subject 3 K Y

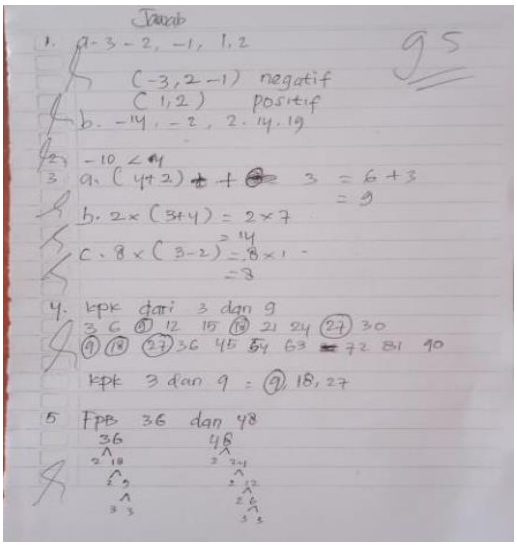

Figure 4. Subject Answers 3

Based on Figure 4. The results of subject 3's answers obtained that in determining positive and negative integers, namely -3, −2, −1.1 and 2, it can be seen that students have been able to determine negative numbers and positive numbers by answering negative numbers are −3, −2 and -1 while the positive numbers are 1 and 2. Then in part b, namely −14, −2,2,14 and 19. In question number 2 which is about comparison, subject 3 has not been able to compare by placing signs/symbols to compare numbers, namely signs greater then subject 3 answered $-10 > 4$. In question number 2, it is given about addition and subtraction of integers using the properties of number operations. Subject 3 determines the sum at point a, namely $(4 + 2) + 3 = 4 + (2 + 3)$ and the result is equal to 9 on the left and right sides. For point b, Subject 3 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 3 writes $2 \times (3 + 4) = 2 \times 3 + 2 \times 4$ which results equal to 14 in left side and right side. For point c, Subject 3 uses the commutative property, namely $a \times (b + c) = a \times b + a \times c$ so Subject 3 writes $8 \times (3 - 2) = 8 \times 3 - 8 \times 2$ which has the same result as -8 on the left and right side. Next to determine the KPK and FPB. Subject 3 was able to determine the LCM from 3 and 9, namely 9, 18 and 27. As for question number 5, to determine the GPA of 36 and 48, Subject 3 used the factor tree method to determine the GPA so that they obtained the GPA of 36 and 48 but had not yet determined the results.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

d. Subject 4 RYK

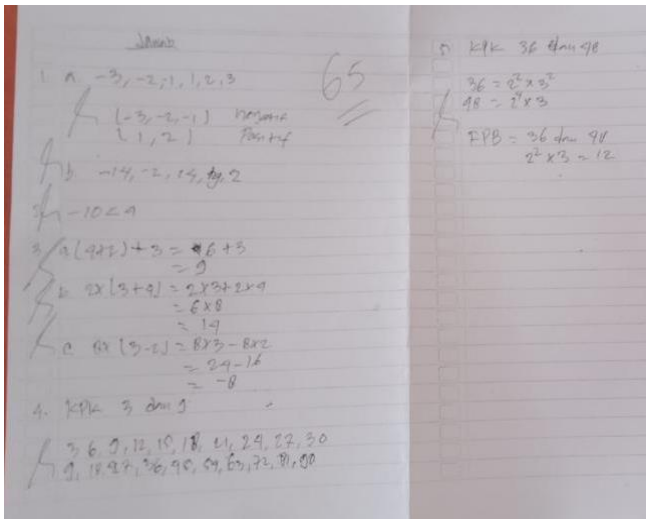

Figure 5. Subject Answers 4

Based on Figure 4. The results of subject 4's answers obtained that in determining positive and negative integers, namely -3,-2,-1.1 and 2, it can be seen that students have been able to determine negative numbers and positive numbers by answering negative numbers are -3,-2 and -1 while the positive numbers are 1 and 2. Then in part b, namely -14,-2,2,14 and 19. In question number 2, which is about comparison, subject 4 has not been able to compare by placing signs/symbols to compare numbers, namely signs greater then subject 2 answered -10>4. In question number 2, it is given about addition and subtraction of integers using the properties of number operations. Subject 2 determines the sum at point a, namely (4+2)+3=4+(2+3) and the result is equal to 9 on the left and right sides. For point b, Subject 4 uses the commutative property, namely a×(b+c)=a×b+a×c so Subject 4 writes 2×(3+4)=2×3+2×4 which results equal to 14 in left side and right side. For point c, Subject 4 uses the commutative property, namely a×(b+c)=a×b+a×c so Subject 4 writes 8×(3-2)=8×3-8×2 which has the same result as -8 on the left and right side. Next to determine the KPK and FPB. Subject 4 was able to determine the LCM from 3 and 9, namely 9, 18 and 27. As for question number 5, to determine the GPA of 36 and 48, Subject 4 used the factor tree method to determine the GPA so that they obtained the GPA of 36 and 48 but had not yet determined the results.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

e. Subject 5 LL

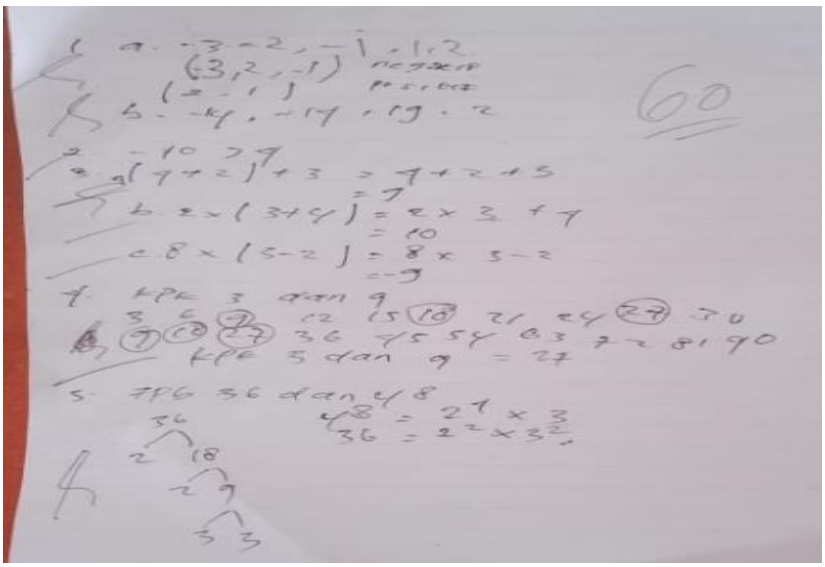

Figure 5. Subject Answers 5

Based on Figure 5, the results of Subject 5's answers obtained that in determining positive and negative numbers, namely $-3, -2, -1.1$ and 2, it can be seen that students have been able to determine negative numbers $are\ -3, -2$,and-1 while positive numbers are 1 and 2. Furthermore, in part b, namely -2,19,14, $-14, and\ 2$ students have not been able to sort the numbers from smallest to largest by answering -14,14,9 and 2. In question number 2, which is about the comparison of subject 6 unable to compare by placing the correct sign/symbol to compare numbers, namely the sign is smaller or less than, the subject answered $-10 > 4$. In question number 3, it was given about the operations of addition and subtraction of integers using the properties of number operations. Subject 5 has not been able to determine the sum result at point a which uses the commutative characteristic, namely $(a + b) + c = a + (b + c)$ so the subject writes $(4 + 2) + 3 = 4 + 2 + 3$ and the result equals 9 on the right side on the left side there is no result. For point b subject 5 has not been able to use the distributive property in multiplication to addition, namely $a \times (b + c) = a \times b + a \times c$ so subject 5 writes $2 \times (3 + 4) = 2 \times 3 \times 4$ which results are the same with 10, for point c, subject also has not been able to use the distributive property in multiplication to subtraction, namely $a \times (b - c) = a \times b - a \times c$ so subject 5 writes $8 \times (3 - 2) = 8x3 - 2$ which has the same result with -9. Furthermore, in number 4, determining the KPK, the subject has not been able to determine the KPK from 3 and 9, namely 27. Furthermore, at number 5, determines FPB 36 and 48, subject 5 uses a fact tree to determine GCF so that it obtains FPB 36 and 48 but there are no results. Based on the results of the description of the answers students above,

student learning outcomes on integer material, KPK and FPB there is an increase in student learning outcomes with the flipped classroom model approach.

In the conditions in which Indonesia was forged with Covid-19, the Government was required to be able to carry out the learning process. One of the things in order to continue carrying out the learning process, educators must master science and technology to overcome this problem, namely online / online learning. Learning carried out must be effective in carrying out the teaching and learning process. The learning process with the flipped classroom approach is one way to carry out learning. The learning approach used in the student teaching and learning process is to first study teaching materials at home through the WA Group that has been created by educators. Teaching materials at home can be in the form of learning videos, theoretical documents and practice questions as independent assignments for students. After students study at home independently, when face-to-face in class, educators only quickly repeat material from teaching materials that have been studied at home. Students are trained to discuss in solving problems (Aritonang & Safitri, 2021; Hariati et al., 2020; Hasanah et al., 2021; Hildani & Safitri, 2021; Latif et al., 2020; Raka Siwa et al., 2018; Rezekiah et al., 2022; Romaito et al., 2021; Romansyah et al., 2019; Safitri, 2017a, 2017b; Safitri & Hasibuan, 2018b, 2018a).

This learning process is different from the learning process that usually occurs. Students feel that this learning method is unique, not boring and arouses curiosity and curiosity about solving problems given by educators. Students feel happy when discussing in groups because they exchange ideas, help each other and freely ask for help from educators when experiencing difficulties. Even though sometimes problems cannot be solved as expected, the discussion from friends and educators at the end of the lesson really helps understanding and mastering problem-solving skills.

The use of technology as a learning tool can also help the student learning process. Even though students may not necessarily be able to understand study material at home well, students can continuously repeat material delivered via video whenever and wherever they want to study. The use of this technology makes the learning process at home practical as long as there is an internet signal. This flipped classroom approach respects and trusts students. Students are valued and trusted as individual learners who are able to study independently at home. If the general trend holds the opposite view, students are individuals who cannot learn independently, this learning model instead uses a perspective that is reversed from the general flow. Students are individuals who have great potential to construct knowledge independently and educators are sufficient to be facilitators who prepare adequate facilities and assistance for student learning.

JURNAL EDUSCIENCE (JES)
p-ISSN : 2303 - 355X | e-ISSN : 2685 - 2217
PUBLISHED BY : LPPM of UNIVERSITAS LABUHANBATU

CONCLUSION

Based on the results of the research and the results of the test analysis of class VII students at SMP Negeri 4 Tanimbar Selatan, it can be concluded that applying the flipped classroom model can overcome problems with the face-to-face learning process and can improve student learning outcomes. This can be seen from the results of the final test of students who take part in the learning process because they feel happy when discussing in groups because they exchange ideas, help each other and freely ask for help from educators when experiencing difficulties.

REFERENCES

Aritonang, I., & Safitri, I. (2021). Pengaruh blended learning terhadap peningkatan literasi matematika siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *5*(1), 735–743. https://doi.org/https://doi.org/10.31004/cendekia.v5i1.555

Hariati, P. N. S., Hasibuan, lily R., & Safitri, I. (2020). Pengaruh penggunaan media video animasi terhadap respon siswa dalam pembelajaran matematika pada materi operasi bilangan bulat. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *6*(1), 18–22. https://doi.org/https://doi.org/10.36987/jpms.v6i1.1657

Hasanah, U., Safitri, I., Rukiah, & Nasution, M. (2021). Menganalisis perkembangan media pembelajaran matematika terhadap hasil belajar berbasis game. *Indonesian Journal of Intellectual Publication*, *1*(3), 204–2011. https://doi.org/https://doi.org/10.51577/ijipublication.v1i3.125

Hildani, T., & Safitri, I. (2021). Implementation of JSIT Curriculum-Based Mathematics Learning in Forming Students Character. *Daya Matematis: Jurnal Inovasi Pendidikan Matematika*, *9*(1), 66–70. https://doi.org/https://doi.org/10.26858/jdm.v9i1.19374

Latif, A., Safitri, I., & Pasaribu, L. H. (2020). PENGARUH METODE PEMBELAJARAN PROBLEM SOLVING TERHADAP AKTIVITAS BELAJAR SISWA. *Jurnal Eduscience*, *7*(2), 1–9. https://doi.org/https://doi.org/10.36987/jes.v7i2.1907

Raka Siwa, L. A., Safitri, I., & Pasaribu, L. H. (2018). Perbandingan Model Pembelajaran Kooperatif Tipe Jigsaw dengan Stad (Student Team Achievement Division) terhadap Kemampuan Pemecahan Masalah Matematika Siswa Kelas XI SMA …. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *4*(2), 17–26. https://doi.org/doi.org/10.36987/jpms.v4i2.1256

Ratuanik, M., & Feninlambir, S. (2022). Pemanfaatan Software Geogebra pada Materi Lingkaran dengan Menggunakan Model Discovery Learning untuk Meningkatkan Hasil Belajar Siswa Kelas VIII SMP Negeri 1 Tanimbar Utara. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(1), 1105–1119. https://doi.org/10.31004/cendekia.v6i1.1042

Rezekiah, P. T., Safitri, I., & Harahap, R. D. (2022). Analisis Nilai-Nilai Karakter Mahasiswa Program Studi Pendidikan Matematika. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *6*(2), 1251–1267. https://doi.org/https://doi.org/10.31004/cendekia.v6i2.1325

Romaito, P., Safitri, I., & Nisah, H. (2021). The Mathematics Learning using Geogebra Software to Improve Students ' CreativeThinking Ability The Mathematics Learning using Geogebra Software to Improve Students ' CreativeThinking Ability. *Journal of Physics: Conference Series*, *1819*(1), 012008. https://doi.org/10.1088/1742-6596/1819/1/012008

Romansyah, Suriyani, & Safitri, I. (2019). Pengembangan Bahan Ajar Materi Lingkaran Berbasis Pembelajaran Matematika Realistik Untuk Meningkatkan Kemampuan Pemecahan Masalah Matematika Siswa Kelas VIII. *Jurnal MathEducation Nusantara*, *2*(2), 133–138. https://doi.org/doi.org/10.32696/jmn.v2i2.82

Riwayani, S., Harahap, RD. (2022). Does Blended Learning Improve Student's Learning dependence during the Covid-19 Pandemic? Evidence from a Labuhanbatu University, North Sumatera. : Jurnal Kependidikan. 8 (1), DOI: https://doi.org/10.33394/jk.v8i1.4509

Saputra, A., Harahap, RD. (2022). An Analysis of Student Learning Challenges in Elementary School Science Subject. Jurnal Kependidikan. 8 (1), DOI: https://doi.org/10.33394/jk.v8i1.4508

Safitri, I. (2017a). Pengaruh Media Audio Visual terhadap Kemampuan Pemahaman Konsep Matematika Dikelas X SMA Muhammadiyah-10 Rantauprapat Tahun Pembelajaran 2016/2017. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *3*(1), 14–23. https://jurnal.ulb.ac.id/index.php/sigma/article/viewFile/1277/1260

Safitri, I. (2017b). Perbandingan Kemampuan Pemecahan Masalah Matematika Siswa yang Diajar dengan Model Pembelajaran Contextual Teaching And Learning dan Pembelajaran Konvensional. *Jurnal Pembelajaran Dan Matematika Sigma (JPMS)*, *3*(2), 10–14. https://doi.org/doi.org/10.36987/jpms.v3i2.1296

Safitri, I., & Hasibuan, lily R. (2018a). PEMBELAJARAN ANALOGI PADA KONSEP VEKTOR UNTUK MEMBENTUK SIKAP DAN MORAL SISWA KELAS X SMA NEGERI 1 RANTAU UTARA. *Simposium Fisika Nasional*, 240–249.

Safitri, I., & Hasibuan, lily R. (2018b). The Character Education Through Analogy Learning Implementation on Vector Concepts. *Jurnal Penelitian & Pengembangan Pendidikan Fisika*, *4*(2), 75–82. https://doi.org/doi.org/10.21009/1.04204

Efendi, A., & Maskar, S. (2020). Studi Pendahuluan: Pengaruh Model Pembelajaran Flipped Classroom Terhadap Hasil Belajar Matematika Siswa Smk Islam Adiluwih. *Jurnal Ilmiah Matematika Realistik (JI-MR*, *3*(1), 50–53.

Kristanto, Y. D. (2020). Upaya Peningkatan Kualitas Pembelajaran Matematika Melalui Flipped Classroom dan Gamifikasi: Suatu Kajian Pustaka. *PRISMA, Prosiding Seminar Nasional Matematika*, *3*, 266–278.

Walidah, Z., Wijayanti, R., & Affaf, M. (2020). Pengaruh Model Pembelajaran Flipped Classroom (FC) terhadap Hasil Belajar. *Edumatica | Jurnal Pendidikan Matematika*, *10*(2), 71–77.