PROSIDING
SEMINAR NASIONAL JURUSAN MATEMATIKA 2023

"Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju"

Kamis, 9 November 2023
Aula lantai 3 Gedung FMIPA

Penyelenggara :

Jurusan Matematika
Fakultas Matematika dan Ilmu Pengetahuan Alam
Universitas Negeri Medan

UNIMED Publisher
"Transforming Ideas into Writing"

PROSIDING SEMINAR NASIONAL
JURUSAN MATEMATIKA 2023
"Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju"

Penyelenggara :
Jurusan Matematika FMIPA - UNIMED

PROFIL PENERBIT

Nama Penerbit :
Lembaga Penerbitan dan Publikasi UNIMED PUBLISHER
Universitas Negeri Medan.

Layout :
Team
Desain Cover:
Team

Redaksi :

Lembaga Penerbitan dan Publikasi UNIMED PUBLISHER
Universitas Negeri Medan.
Jalan Willem Iskandar Pasar V – Kotak Pos Nomor 1589 – Medan 20221
Telepon/WA 0822 – 6760 – 0400, Email : publisher@unimed.ac.id
Website : https://publisher.unimed.ac.id

ISBN : 978-623-5951-32-4
978-623-5951-33-1 (EPUB)

TIM REDAKSI PROSIDING
SEMINAR NASIONAL JURUSAN MATEMATIKA
FMIPA UNIVERSITAS NEGERI MEDAN

"Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju"

Universitas Negeri Medan, 09 November 2023

SUSUNAN PANITIA

Ketua:
Susiana, S.Si., M.Si.

Sekretaris:
Suvriadi Panggabean, M.Si.

Sekretariat:
Ade Andriani, S.Pd., M.Pd.
Nurul Ain Farhana, M.Si.
Sisti Nadia Amalia, S.Pd., M.Stat.
Andrea Arifsyah Nasution, S.Pd., M.Sc.
Arnah Ritonga, S.Si., M.Si.

Publikasi:
Insan Taufik, S.Kom., M.Kom
Dinda Kartika, S.Pd., M.Si.
Dian Septiana, S.Pd., M.Sc.
Putri Maulidina Fadilah, M.Si.
Fevi Rahmawati Suwanto, S.Pd., M.Pd.
Putri Harliana, S.T., M.Kom.
Nadrah Afiati Nasution, M.Pd.

Acara:
Hanna Dewi Marina Hutabarat, S.Si., M.Si.
Marlina Setia Sinaga, S.Si., M.Si.
Chairunisah, S.Si., M.Si.
Eri Widyastuti, S.Pd., M. Sc.
Kairuddin, S.Si., M.Pd.
Dr. Nerli Khairani, M.Si.
Dr. Faiz Ahyaningsih, M.Si.

Logistik:
Muhammad Badzlan Darari, S.Pd., M.Pd.
Ichwanul Muslim Karo Karo, M. Kom.
Denny Haris, S.Si., M.Pd.
Faridawaty Marpaung, S.Si., M.Si.
Dra. Katrina Samosir, M.Pd.

Humas & Dokumentasi:
Sri Lestari Manurung, S.Pd., M.Pd.
Tiur Malasari Siregar, S.Pd., M.Si.
Dra. Nurliani Manurung, M.Pd.
Nurul Maulida Surbakti, M.Si.
Adidtya Perdana, S.T., M.Kom.
Dedy Kiswanto, S. Kom., M. Kom.

KATA PENGANTAR
KETUA PANITIA

Segala puji dan syukur kepada Allah SWT atas terbitnya Prosiding Seminar Nasional Jurusan Matematika (SEMNASTIKA) FMIPA Universitas Negeri Medan. Prosiding ini merupakan kumpulan artikel ilmiah yang telah dipresentasikan pada kegiatan SEMNASTIKA 09 November 2023 di Aula Gedung Prof. Syawal Gultom, Universitas Negeri Medan. Adapun cakupan bidang kajian yang disajikan dalam prosiding ini meliputi Matematika, Statistika, Ilmu Komputer, dan Pendidikan Matematika.

Dengan mengangkat tema seminar, "Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju", kami mengharapkan SEMNASTIKA dapat turut serta berkontribusi bagi perkembangan ilmu pengetahuan jurusan matematika sebagai wadah bagi para peneliti, praktisi, penggiat pendidikan matematika dan pengguna untuk terjalinnya komunikasi dan diseminasi hasil-hasil penelitian.

Kegiatan SEMNASTIKA dan prosiding ini dapat diselesaikan dengan baik tidak terlepas dari bantuan berbagai pihak, oleh sebab itu kami mengucapkan banyak terimakasih kepada:

1. Pimpinan Universitas Negeri Medan
2. Dekan FMIPA dan para Wakil Dekan FMIPA Universitas Negeri Medan
3. Para Narasumber yaitu Bapak Prof. Dr. Janson Naiborhu, M.Si., Bapak Mangara Marianus Simanjorang, M.Pd., Ph.D dan Bapak Ahmad Isnaini, M.Pd.
4. Ketua Jurusan Matematika FMIPA Universitas Negeri Medan
5. Para Ketua Program Studi di Jurusan Matematika Universitas Negeri Medan
6. Panitia SEMNASTIKA
7. Pemakalah dan Peserta SEMNASTIKA
8. Semua pihak yang terlibat dalam pelaksanaan SEMNASTIKA

Kami menyadari bahwa buku prosiding ini masih jauh dari kata sempurna, karena itu kami mengharapkan kritik dan saran yang membangun dari para pembaca untuk perbaikan selanjutnya. Akhirnya, kami menghaturkan maaf jikalau ada hal-hal yang kurang berkenan bagi para pembaca serta ucapan terimakasih kepada semua pihak yang telah berkontribusi bagi terbitnya buku prosiding ini. Semoga buku prosiding ini dapat memberikan manfaat sesuai dengan yang diharapkan.

Medan, November 2023
Ketua Panitia,

Susiana, S.Si., M.Si.
NIP.197905192005012004

KATA PENGANTAR
DEKAN FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS NEGERI MEDAN

Puji dan Syukur kepada Allah SWT atas segala rahmat dan anugerah-Nya sehingga Prosiding Seminar Nasional Jurusan Matematika dengan tema "Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju" yang diselenggarakan oleh Jurusan Matematika FMIPA Universitas Negeri Medan pada hari Kamis, 09 November 2023 di Medan dapat diselesaikan.

Publikasi prosiding ini bertujuan untuk memperluas wawasan pengetahuan yang berasal dari para akademisi baik dari Universitas Negeri Medan maupun yang berasal dari luar Universitas Negeri Medan. Selain itu, prosiding ini juga sebagai sarana untuk mengkomunikasikan hasil penelitian dengan menyajikan topik-topik terbaru yang meliputi bidang Pendidikan Matematika, Statistika, Ilmu Komputer dan Matematika.

Kami mengucapkan terimakasih dan apresiasi yang setinggi-tingginya kepada semua pihak yang telah berkontribusi dalam Seminar Nasional Jurusan Matematika, baik sebagai keynote speakers yaitu Prof. Dr. Janson Naiborhu, M.Si., Mangara Marianus Simanjorang, M.Pd., Ph.D dan Ahmad Isnaini, M.Pd., reviewer makalah, peserta dam panitia yang terlibat. Akhir kata, semoga Prosiding Seminar Nasional Jurusan Matematika ini bermanfaat bagi kita semua sehingga dapat memberikan kontribusi maksimal bagi negara dan bangsa.

Medan, November 2023
Dekan

Prof. Dr. Fauziyah Harahap, M.Si
NIP. 196607281991032002

KATA PENGANTAR
KETUA JURUSAN MATEMATIKA
FMIPA UNIVERSITAS NEGERI MEDAN

Dengan penuh rasa syukur kepada Allah SWT, prosiding Seminar Nasional Jurusan Matematika FMIPA Universitas Negeri Medan ini dapat diselesaikan. Kemajuan ilmu pengetahuan dan teknologi di era ini sangat berdampak bagi kehidupan manusia. Kajian penelitian terkait perkembangan ilmu pengetahuan dan teknologi serta terapannya perlu disosialisasikan kepada khalayak. Seminar Nasional Jurusan Matematika merupakan forum diskusi ilmiah yang sangat penting dalam pengembangan dan penyebaran pengetahuan di bidang matematika yang meliputi pendidikan matematika, statistika, ilmu komputer dan matematika (non pendidikan). Melalui buku prosiding ini, kami berupaya untuk menyajikan rangkuman makalah-makalah yang telah dipresentasikan, serta memberikan wadah bagi pembaca untuk menjelajahi gagasan-gagasan cemerlang yang ditawarkan dan penelitian-penelitian terkini yang dihasilkan oleh para akademisi, peneliti, dan praktisi matematika.

Tema seminar kali ini, "Transformasi Matematika dan Teknologi Menuju Generasi Matematika Unggul untuk Pendidikan Indonesia Maju", mencerminkan komitmen kami untuk terus menghadirkan diskusi yang relevan dan mendalam mengenai isu-isu terkini dalam dunia matematika. Melalui buku ini, kami berharap pembaca dapat m engeksplorasi berbagai sudut pandang, temuan, dan pemikiran-pemikiran baru yang dapat memperkaya wawasan serta menginspirasi penelitian dan pengembangan dan ilmu matematika.

Secara khusus, kami mengucapkan terimakasih kepada para narasumber, yaitu : Prof. Dr. Janson Naiborhu, M.Si., Mangara Marianus Simanjorang, M.Pd., Ph.D dan Ahmad Isnaini, M.Pd., yang telah membagikan ilmunya dalam kegiatan seminar. Terimakasih yang tulus juga kami sampaikan kepada semua pihak yang telah mendukung kegiatan ini, para pimpinan Universitas Negeri Medan dan para pimpinan FMIPA Universitas Negeri Medan. Apresiasi yang tinggi juga saya ucapkan teruntuk para penulis, reviewer, dan panitia yang telah berperan aktif dalam pembuatan buku prosiding ini. Kontribusi dari setiap individu adalah pondasi kesuksesan acara ini, dan semangat kolaboratif ini sangat berharga bagi perkembangan ilmu matematika.

Akhirnya, kami berharap buku prosiding ini dapat menjadi sumber pengetahuan yang bermanfaat dan memotivasi pembaca untuk terus menggali potensi dalam bidang matematika. Mari kita bersama-sama memperkuat dan memajukan ilmu matematika demi keberlanjutan pembaruan pengetahuan.

Medan, November 2023

Ketua Jurusan Matematika

Dr. Pardomuan Sitompul, M.Si
NIP.196911261997021001

SUSUNAN ACARA

Waktu	Kegiatan	**PIC**
08.00 - 08.30	Pendaftaran Ulang	Panitia
08.30 - 09.00	Acara Pembukaan 1. Salam Pembuka 2. Menyanyikan Lagu Indonesia Raya 3. Doa 4. Laporan Ketua Pelaksana 5. Sambutan dan Pembukaan acara seminar oleh Dekan Fakultas Matematika dan Ilmu Pengetahuan Alam 6. Foto Bersama	MC: Putri Maulidina Fadilah, S.Si., M.Si Nurul Ain Farhana, M.Si Khairuddin, M.Pd. Susiana, S,Si., M.Si. Prof. Dr. Fauziyah Harahap,M.Si
09.00 - 10.00	Pembicara I Prof. Dr. Janson Naiborhu, M.Si (Guru Besar Matematika ITB)	Moderator: Yulita Molliq Rangkuti, M.Sc., Ph.D
10.00 - 11.00	Pembicara II Mangaratua Marianus Simanjorang, M.Pd. Ph.D (Dosen Jurusan Matematika UNIMED)	Moderator: Andrea Arifsyah Nasution, S.Pd., M.Sc.
11.00 - 11.45	Pembicara III Ahmad Isnaini, M.Pd (Guru berprestasi Nasional)	Moderator: Dinda Kartika, S.Pd., M.Si.
11.45 - 13.00	ISOMA	
13.00 - 14.30	Sesi I : Seminar Paralel	Moderator Pemakalah Pendamping
14.30 - 16.00	Sesi II: Seminar Paralel	Moderator Pemakalah Pendamping
16.00	Penutupan acara oleh Dekan FMIPA	MC

KEYNOTE SPEAKER

KEYNOTE SPEAKER 1

Prof. Dr. Janson Naiborhu, S.Si., M.Si.

Prof. Janson Naiborhu memiliki dua gelar doktor yang ia peroleh dari Keio University (Jepang) dan Institut Teknologi Bandung. Kariernya sebagai dosen dimulai sejak tahun 1991, sejak ia bergabung sebagai Dosen FMIPA ITB, dengan Kelompok Keahlian Matematika Industri dan Keuangan. Ia menjadi Guru Besar sejak 1 Desember 2014 dan Pembina Utama Muda/Gol IV C sejak 1 April 2011.

Prof. Janson aktif dalam melakukan riset dan telah banyak menghasilkan jurnal ilmiah baik nasional maupun internasional. Namanyapun telah dikenal luas di dunia pendidikan dan industri, khususnya dalam bidang Matematika.

KEYNOTE SPEAKER 2

Mangaratua M Simanjorang, M.Pd., Ph.D

Mangaratua M Simanjorang, M.Pd., Ph.D adalah dosen Pendidikan Matematika di Universitas Negeri Medan. Beliau meraih gelar sarjana di Universitas HKBP Nomensen tahun 2003, dan di tahun 2007 beliau mendapat gelar magister dari Universitas Negeri Surabaya. Beliau melanjutkan program doktor di Murdoch University, Australia dan memperoleh gelar Ph.D tahun 2016. Fokus pada pendidikan matematika, beliau melaksanakan tridarma universitas, beliau mendapatkan penghargaan sebagai dosen muda terbaik tahun 2009.

Dengan menjadi reviewer dan narasumber dibanyak kegiatan seminar, beliau berbagi ilmu dalam bidang pendidikan matematika, pendidikan karakter dan media pembelajaran seperti *augmented reality*.

KEYNOTE SPEAKER 3

Ahmad Isnaini M.Pd.

Ahmad Isnaini, M.Pd adalah seorang pendidik yang memiliki dedikasi tinggi terhadap dunia pendidikan. Ia meraih gelar Sarjana Pendidikan Matematika dari Universitas Negeri Medan pada tahun 2010, kemudian melanjutkan studi pascasarjana dan meraih gelar Magister Pendidikan Matematika pada tahun 2019 dari universitas yang sama. Saat ini, Ahmad sedang mengejar gelar Doktor dalam bidang yang sama di Universitas Negeri Medan.

Ahmad Isnaini juga telah mengukir prestasi gemilang dalam berbagai kompetisi dan olimpiade. Sebagai Finalis Apresiasi GTK 2023 BBGP Sumatera Utara Tingkat Provinsi dan penerima berbagai medali emas, perak, dan perunggu dalam Olimpiade Guru tingkat Nasional dan Provinsi, Ahmad Isnaini memperlihatkan dedikasinya dalam pengembangan kemampuan diri dan juga siswanya.

Tidak hanya aktif di dunia akademis, Ahmad Isnaini juga telah berkontribusi dalam literatur pendidikan. Karya-karyanya yang terpublikasi dalam jurnal nasional dan internasional, serta buku-buku seperti "Guru Merdeka" (2020) dan "Inovasi Pembelajaran" (2018), mencerminkan pemikiran dan wawasan yang mendalam dalam bidang Pendidikan.

DAFTAR ISI

Hal
Halaman Cover ii
Tim Redaksi iii
Susunan Kepanitiaan iv
Kata Pengantar Ketua Panitia v
Kata Pengantar Dekan FMIPA vi
Kata Pengantar Ketua Jurusan Matematika vii
Rundown Acara viii
Keynote Speaker ix
Daftar Isi xi

Bidang Ilmu : Pendidikan Matematika 1

PENGEMBANGAN MEDIA PEMBELAJARAN VIDEO ANIMASI BERBASIS PENDEKATAN PEMBELAJARAN KONTEKSTUAL UNTUK MENINGKATKAN MINAT BELAJAR SISWA SMP NEGERI PERISAI
Dara Kartika, Syawal Gultom ..... 2 -11

PENGEMBANGAN BAHAN AJAR MATEMATIKA BERNUANSA ETNOMATEMATIKA UNTUK MENINGKATKANKEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA
Ikke Fatma, Katrina Samosir ..... 12 - 21

PENGARUH MODEL PEMBELAJARAN BERBASIS MASALAH BERBANTUAN MEDIA GEOGEBRA TERHADAP KEMAMPUAN KONEKSI MATEMATIS SISWA SMP N 35 MEDAN
Yulan Sari Dalimunthe, Pardomuan Sitompul ..... 22 - 29

PENGARUH PENDEKATAN *REALISTIC MATHEMATICS EDUCATION* TERHADAP KEMANDIRIAN BELAJAR MATEMATIKA SISWA KELAS VII DI SMP NEGERI 5 PERCUT SEI TUAN
Annisa Wahyuni Hasibuan, Mangaratua M. Simanjorang ..... 30 - 38

ANALISIS KEMAMPUAN BERPIKIR KREATIF SISWA KELAS VII SMP DITINJAU DARI KEPRIBADIAN *EKSTROVERT* DAN *INTROVERT* YANG DIBELAJARKAN DENGAN MODEL PEMBELAJARAN BERDASARKAN MASALAH
Yana Tasya Damanik, Michael C Simanullang ..... 39 - 47

PERBEDAAN KETERAMPILAN BERPIKIR KRITIS MATEMATIS ANTARA SISWA YANG BELAJAR MELALUI MODEL *THINKING ALOUD PAIR PROBLEM SOLVING* BERBANTUAN SOFTWARE GEOGEBRA DENGAN YANG BELAJAR MELALUI MODEL KONVENSIONAL DI SMAS SANTA LUSIA SEI ROTAN
Fransiskus J.P.S., Waminton R. ..... 48 - 56

PENGARUH MODEL *GAME BASED LEARNING* BERBANTUAN WEB *EDUCANDY* TERHADAP MOTIVASI BELAJAR MATEMATIKA SISWA PADA MATERI ARITMATIKA SOSIAL DI KELAS VII SMP NEGERI 35 MEDAN
Agusti Eka Wardani, Pardomuan Sitompul ..... 57 - 65

PENERAPAN MODEL PEMBELAJARAN BERBASIS MASALAH UNTUK MENINGKATKAN PENALARAN MATEMATIS SISWA DI KELAS VIII SMP NEGERI 28 MEDAN

Frida Yanti Br Lumban Batu, Hamidah Nasution ..... 66 - 75

PENERAPAN MODEL PEMBELAJARAN KOOPERATIF TIPE STAD BERBANTUAN CABRI UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA SISWA KELAS VII DI SMP NEGERI 29 MEDAN.....
Ewilda Sinaga, Zul Amry ..... 76 – 83

PENGEMBANGAN LKPD BERBASIS PENDEKATAN MATEMATIKA REALISTIK UNTUK MENINGKATKAN KEMAMPUAN KOMUNIKASI MATEMATIS SISWA KELAS VII SMP NEGERI 35 MEDAN
Dea Aulia Rahma Rangkuti, Nurhasanah Siregar ..... 84 - 92

PENGARUH MODEL PEMBELAJARAN MATEMATIKA *KNISLEY* DENGAN BERBANTUAN APLIKASI GEOGEBRA TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA SMP
Lina Sehat Sitanggang, Nurliani Manurung..... 93 - 103

PENGEMBANGAN E-LKPD BERBASIS *DISCOVERY LEARNING* BERBANTUAN *KVISOFT FLIPBOOK MAKER* UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KREATIF SISWA KELAS XI SMA
Rio Marcellino Sinaga, Marojahan Panjaitan ..... 104 - 114

PENERAPAN MODEL PEMBELAJARAN *DISCOVERY LEARNING* UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VII/I SMP NEGERI 2 MEDAN
Fadila, Asmin ..... 115 - 123

ANALISIS KEMAMPUAN BERPIKIR KRITIS BERBASIS PENDEKATAN *REALISTIC MATHEMATICS EDUCATION* SISWA KELAS XI SMA NEGERI 17 MEDAN
Ricardo Manik, Zul Amry ..... 124 - 133

PENINGKATAN MINAT BELAJAR MATEMATIKA SISWA MENGGUNAKAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* BERBANTUAN MEDIA KOMIK DI SMP NEGERI 7 MEDAN
Sova Yunita Ritonga, Mukhtar ..... 134 - 142

ANALYZING STUDENTS' MATHEMATICAL LITERACY OF SMP SWASTA MUHAMMADIYAH 21 DOLOK BATU NANGGAR USING PISA-BASED QUESTIONS
Dhea Anisah Putri, Mangaratua Marianus Simanjorang..... 143 - 154

PENGEMBANGAN MEDIA PEMBELAJARAN AUDIO VISUAL BERBANTUAN APLIKASI CAPCUT UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VII SMP MUHAMMADIYAH 03 MEDAN
Nur Fidyati Ramadhan, Nurhasanah Siregar..... 155 - 163

PENGEMBANGAN MEDIA PEMBELAJARAN GEOGEBRA BERBASIS MODEL PEMBELAJARAN KOOPERATIF TIPE STAD DI KELAS X SMAN 4 BINJAI
Angela Farida P. Sitorus, Pargaulan Siagian ..... 164 - 172

PERBEDAAN ANTARA MODEL PEMBELAJARAN KOOPERATIF TIPE TPS DAN EKSPOSITORI TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA DI KELAS XI SMA NEGERI 1 BATANG KUIS
Yemima Eymizia Silaban, Waminton Rajagukguk ..... 173 - 181

PENERAPAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* BERBANTUAN APLIKASI GEOGEBRA UNTUK MENINGKATKAN PEMAHAMAN KONSEP MATEMATIKA SISWA KELAS VIII SMP
Areigi Doanta Sembiring, Izwita Dewi.....182 - 191

PENGARUH MODEL PEMBELAJARAN KOOPERATIF TIPE TWO STAY TWO STRAY TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA PADA SISWA KELAS VIII DI SMP NEGERI 2 PANCUR BATU
Sri Windi Br Ginting, Wingston L. Sihombing.....192 - 200

PERBANDINGAN ANTARA MODEL PEMBELAJARAN *PROJECT BASED LEARNING* DAN MODEL PEMBELAJARAN KONVENSIONAL TERHADAP KEMAMPUANPEMAHAMAN KONSEP MATEMATIS SISWA
Ezra Pebiola Lumbantobing, Tiur Malasari Siregar.....201 - 206

THE EFFORTS TO IMPROVE STUDENTS' ABILITY INUNDERSTANDING MATHEMATICAL CONCEPT WITH MISSOURI MATHEMATIC PROJECT LEARNING MODEL IN GRADE VIII OF SMP NEGERI 1 AIR PUTIH
Nurul Afifah Syahputri, Hasratuddin .....207 - 214

PENERAPAN MODEL PEMBELAJARAN MATEMATIKA REALISTIK BERBANTUAN GEOGEBRA UNTUK MENINGKATKAN KEMAMPUAN SPASIAL SISWA SMP NEGERI 23 MEDAN
Dewi Ramadhani, Hasratuddin .....215 - 223

PENERAPAN MODEL PEMBELAJARAN KOOPERATIF TIPE *TEAM ASSISTED INDIVIDUALIZATION* UNTUK MENINGKATKAN KEMAMPUAN KOMUNIKASI MATEMATIS SISWA KELAS VIII SMP PAB 8 SAMPALI
Muhammad Zulham Syahputra, Nurhasanah Siregar .....224 - 232

PENGEMBANGAN BAHAN AJAR E-MODUL MENGGUNAKAN APLIKASI *KVISOFT FLIPBOOK MAKER* BERBASIS MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* DI SMP NEGERI 16 MEDAN
Vanny Rahmadani, Yasifati Hia .....233 - 240

PENGARUH KEMAMPUAN KOMUNIKASI MATEMATIS, KEMAMPUAN VISUAL, KEMAMPUAN SPASIAL DAN KEMAMPUAN LITERASI MATEMATIS TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA SISWA
Vinky Ruth Amelia Br Hasibuan, Edi Syahputra .....241 - 249

PENERAPAN MODEL PEMBELAJARAN KOOPERATIF TIPE STAD BERBANTUAN *SOFTWARE* GEOGEBRA UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VIII
Nurhalimah Manurung, Mukhtar .....250 - 259

PENGEMBANGAN MEDIA PEMBELAJARAN INTERAKTIF BERBASIS PBL BERBANTUAN WEBSITE CANVA UNTUK MENINGKATKAN PEMAHAMAN KONSEP MATEMATIS SISWA
Aisah Queenela Br Pelawi, Prihatin Ningsih Sagala.....260 -269

EFEKTIVITAS MODEL PEMBELAJARAN KOOPERATIF TIPE TEAMS GAMES TOURNAMENT UNTUK MENINGKATKAN PEMAHAMAN KONSEP MATEMATIS SISWA
Veronica Gulo, E. Elvis Napitupulu .....270 - 279

PENGARUH MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* MENGGUNAKAN CABRI 3D TERHADAP KEMAMPUAN SPASIAL SISWA KELAS VIII
Anggry F Hutasoit, Mangaratua Marianus Simanjorang .....280 - 286

PENERAPAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* UNTUK MENINGKATKAN KEAKTIFAN BELAJAR SISWA PADA PEMBELAJARAN MATEMATIKA
Mastiur Santi Sihombing, Syawal Gultom.....287 - 294

PENGARUH MODEL PEMBELAJARAN KOOPERATIF TIPE *PAIR CHECK* TERHADAP KEMAMPUAN PEMAHAMAN KONSEP MATEMATIS SISWA KELAS VIII MTs NEGERI 1 SIMALUNGUN
Lifia Humairah, Hamidah Nasution .....295 - 301

PERBEDAAN KEMAMPUAN KONEKSI MATEMATIS SISWA YANG DIAJAR MELALUI MODEL PEMBELAJARAN BERBASIS MASALAH DAN KONVENSIONAL DI KELAS VIII SMP NEGERI 7 MEDAN
Audita Marselina Manik, Waminton Rajagukguk.....302- 310

THE IMPLEMENTATION OF COOPERATIVE LEARNING MODEL STAD TYPE TO IMPROVE STUDENTS' PROBLEM-SOLVING ABILITY IN CLASS VII SMP NEGERI 37 MEDAN
Evelyn Angelika, Nurhasanah Siregar .....311 - 318

IMPLEMENTASI *VIDEO EXPLAINER* SEBAGAI STRATEGI DALAM PENINGKATAN KEMAMPUAN PEMECAHAN MASALAH SISWA
Nurul Bahri, Suci Frisnoiry.....319 - 327

UPAYA MENINGKATKAN KEMAMPUAN BERPIKIR KREATIF SISWA KELAS VIII SMP NEGERI 17 MEDAN MELALUI PENERAPAN PEMBELAJARAN REALISTIC MATHEMATICS EDUCATION
Feby Greciana Damanik, Bornok Sinaga ..... 328 - 337

UPAYA MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VIII SMP PERGURUAN KEBANGSAAN MELALUI PENERAPAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* BERBANTUAN AUTOGRAPH
Yuli Masita Sari, Bornok Sinaga ..... 338 - 346

PENGGUNAAN MEDIA BELAJAR E-MODUL TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA DI KELAS VIII SMP
Maria Nadia Sirait, Nurhasanah Siregar ..... 347 - 355
.....

PENGEMBANGAN E-MODUL INTERAKTIF MENGGUNAKAN FLIP PDF PROFESSIONAL BERBASIS PENDEKATAN RME UNTUK MENINGKATKAN KEMAMPUAN VISUAL THINKING SISWA KELAS VIII DI SMP SWASTA PRAYATNA MEDAN
Pelni Rodearni Sipakkar, Kms. Muhammad Amin Fauzi ..... 356 - 363

PENERAPAN MODEL PEMBELAJARAN PROBLEM BASED LEARNING DENGAN PENDEKATAN OPEN-ENDED UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH SISWA KELAS XI SMA MATEMATIKA

Oswaldo Raphael Sagala, Sri Lestari Manurung ..... 364 - 372

ANALISIS KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA SMA
Aprizal, E. Elvis Napitupulu ..... 373 - 382

PENGARUH MODEL PEMBELAJARAN *BRAIN BASED LEARNING* BERBANTUAN *BRAIN GYM* TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA KELAS VIII SMP
Syahir Sasri Habibi, Izwita Dewi ..... 383 - 391

PENERAPAN MODEL PEMBELAJARAN KOOPERATIF TIPE STAD BERBANTUAN GEOGEBRA UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VIII SMP
Vida Gresiana Dachi, Mukhtar ..... 392 – 400

IMPLEMENTATION OF RECIPROCAL TEACHING LEARNING MODEL TO IMPROVE STUDENTS' MATHEMATICAL REPRESENTATION ABILITY IN GRADE VII AT SMP NEGERI 37 MEDAN
Royana Chairani, Hasratuddin ..... 401 - 407

PENGEMBANGAN MEDIA PEMBELAJARAN INTERAKTIF BERBASIS POWERPOINT DAN ISPRING DI ANDROID UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA
Dita Aryani, Katrina Samosir ..... 408 - 417

PERBEDAAN PENINGKATAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA SISWA MENGGUNAKAN MODEL *PROBLEM BASED LEARNING* DAN MODEL KOOPERATIF TIPE STAD SMA NEGERI 1 PERBAUNGAN .....
Christian Javieri Andika, Sri Lestari Manurung..... 418 - 425

PENGARUH PENDEKATAN PEMBELAJARAN MATEMATIKA TERHADAP KEMAMPUAN LITERASI NUMERASI MATEMATIS SISWA SMP NEGERI 2 PERCUT SEI TUAN
Fauziyyah, Dian Armanto ..... 426 - 435

PENERAPAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* DENGAN PENDEKATAN *CREATIVE PROBLEM SOLVING* UNTUK MENINGKATKAN KEMAMPUAN PEMAHAMAN KONSEP MATEMATIS SISWA MTsN 1 ACEH TENGGARA
Naila Fauziah, Asrin Lubis..... 436 - 445

IMPLEMENTASI MODEL PEMBELAJARAN *LEARNING CYCLE* 5E UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA SMA
Wilson Sihotang, Nurliani Manurung ..... 446 - 453

THE IMPLEMENTATION OF PROBLEM BASED LEARNING MODEL ASSISTED BY GEOGEBRA SOFTWARE TO IMPROVE STUDENTS' MATHEMATICAL PROBLEM-SOLVING ABILITY IN GRADE X AT SMA NEGERI 8 MEDAN
Grace Margareth Stevany Sinurat *, Pardomuan N.J.M Sinambela ..... 454 - 461

PENGEMBANGAN MEDIA PEMBELAJARAN VIDEO ANIMASI UNTUK MENINGKATKAN MINAT BELAJAR MATEMATIKA SISWA KELAS X.....
Marince, Katrina Samosir ..... 462 - 471

PENGEMBANGAN MEDIA PEMBELAJARAN MATEMATIKA INTERAKTIF BERBASIS RME BERBANTUAN *SOFTWARE ISPRING* DALAM MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA
Rupina Aritonang, Edi Syahputra..... 472 - 480

ANALYSIS OF STUDENT'S MATHEMATICAL COMMUNICATION ABILITY IN THE IMPLEMENTATION OF THE JIGSAW TYPE COOPERATIVE LEARNING MODEL IN SMP NEGERI 35 MEDAN
T. Asima Sulys Simanjuntak, Bornok Sinaga..... 481 - 490

PENGARUH PEMBELAJARAN MATEMATIKA MENGGUNAKAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* TERHADAP KEMAMPUAN BERPIKIR KRITIS SISWA SMK
Enikristina Simbolon, Edy Surya ..... 491 - 500

PENERAPAN MODEL PEMBELAJARAN *MISSOURI MATHEMATICS PROJECT* UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS XI DI SMAN 1 KEJURUAN MUDA
Hanifah Rusydah, Katrina Samosir..... 501 - 506

INCREASED UNDERSTANDING OF MATHEMATICAL CONCEPTS AND MOTIVATION WITH A PROBLEM POSING APPROACH ON CLASS VIII MTs NEGERI 2 RANTAUPRAPAT
Miftahul Jannah, Nurhasanah Siregar ..... 507 - 511

PENGEMBANGAN LKPD MATEMATIKA BERBASIS STEM UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH SISWA KELAS VIII SMP
Parah Galu Pangestu, Kms. Muhammad Amin Fauzi ..... 512 - 519

PENGEMBANGAN MEDIA AUDIO VISUAL BERDASARKAN MODEL PEMBELAJARAN SAVI UNTUK MENINGKATKAN KEMAMPUAN PENALARAN MATEMATIS SISWA SMA NEGERI 1 TAMIANG HULU
Nona Farahdiba, Syawal Gultom ..... 520 - 529

PENGEMBANGAN MEDIA PEMBELAJARAN BERBASIS POWTOON PADA MATERI KEKONGRUENAN DAN KESEBANGUNAN DI KELAS IX SMP IT AD DURRAH
Putri Heriyani, Nurhasanah Siregar ..... 530 - 537

PENGARUH PEMBELAJARAN BERBASIS MASALAH DENGAN PENDEKATAN KONTEKSTUAL TERHADAP KEMAMPUAN REPRESENTASI MATEMATIS SISWA
Siti Marwa Hernawan, Pardomuan Sitompul..... 538 - 546

IMPLEMENTASI MODEL PEMBELAJARAN BERBASIS MASALAH UNTUK MENINGKATKAN KOMUNIKASI MATEMATIKA DILIHAT DARI PARTISIPASI SISWA PADA PEMBELAJARAN MATEMATIKA
Widya Ramadhani, Syawal Gultom ..... 547 - 555

PENGEMBANGAN MEDIA PEMBELAJARAN MATEMATIKA INTERAKTIF APLIKASI ANDROID BERBASIS RME MELALUI PENDEKATAN *BLENDED LEARNING*
Cristin Natalia Napitupulu, Edi Syahputra..... 556 - 563

PENGEMBANGAN PERANGKAT PEMBELAJARAN BERBASIS REALISTIC MATHEMATICS EDUCATION UNTUK MENINGKATKAN KEMAMPUAN VISUAL SISWA SMP
Oktalena Zai, Edi Syahputra ..... 564 - 569

PENGEMBANGAN MEDIA PEMBELAJARAN QUIZ MATEMATIKA INTERAKTIF BERBASIS WEB UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH SISWA KELAS XI SMA NEGERI 9 MEDAN
Aris Saputra Pardede, Muliawan Firdaus..... 570 - 576

PENERAPAN MODEL CONTEXTUAL TEACHING AND LEARNING BERBANTUAN E-LKPD DALAM MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS SISWA KELAS VIII SMPN 24 MEDAN
Teddy Soemantry Sianturi, Muliawan Firdaus..... 577 - 587

PENGEMBANGAN BAHAN AJAR MATEMATIKA MELALUI PEMBELAJARAN MATEMATIKA REALISTIK BERBANTUAN SOFTWARE GEOGEBRA UNTUK MENINGKATKAN KEMAMPUAN SPASIAL SISWA SMPN 35 MEDAN
Tri Ambarwati Nurul Putri, Muhammad KMS Amin Fauzi ..... 588 - 594

PENGEMBANGAN LEMBAR KERJA PESERTA DIDIK (LKPD) BERBASIS *PROBLEM SOLVING* UNTUK MENINGKATKAN PEMECAHAN MASALAH MATEMATIS SISWA SMA KELAS X
Aida Hafni Rambe, Pargaulan Siagian..... 595 - 603

PENGEMBANGAN LKPD BERBASIS PMR UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KRITIS PADA SISWA KELAS XI SMA NEGERI 14 MEDAN
Sartika Rismaya Manihuruk, Pargaulan Siagian..... 604 - 610

PENGEMBANGAN BUKU DIGITAL BERBASIS PMR UNTUK MENINGKATKAN KEMAMPUAN LITERASI NUMERASI DAN SELF-EFFICACY SISWA KELAS VIII SMP
Nina Novsyiah Sihombing, Kms Muhammad Amin Fauzi..... 611 - 620

UPAYA MENINGKATKAN KEMAMPUAN PEMAHAMAN KONSEP MATEMATIKA SISWA MELALUI PENERAPAN MODEL PEMBELAJARAN PROBLEM BASED LEARNING BERBANTUAN VIDEO PEMBELAJARAN DI KELAS VII
Dilla Hafizzah, Mukhtar..... 621 - 629

THE EFFECT OF PROBLEM-BASED LEARNING MODEL ASSISTED BY GEOGEBRA SOFTWARE ON STUDENTS' MATHEMATICAL COMMUNICATION ABILITYIN SMP N 1 SELESAI
Dwi Antika Br Nasution, E. Elvis Napitupulu ..... 630 - 637

ANALISIS KEMAMPUAN BERPIKIR KREATIF MATEMATIS SISWA SETELAH DIBELAJARKAN DENGAN MODEL PEMBELAJARAN PROBLEM BASED LEARNING
Adrianus Juan Felix Butar Butar, Syawal Gultom ..... 638 - 646

HUBUNGAN KEMANDIRIAN DAN MINAT BELAJAR TERHADAP KEMAMPUAN PENALARAN MATEMATIS SISWA DENGAN MODEL PROBLEM BASED LEARNING DI SMP NEGERI 29 MEDAN
Lulu Madame Silalahi, Dian Armanto ..... 647 - 656

ANALISIS KESALAHAN SISWA DALAM PENYELESAIAN MASALAH MATEMATIS MELALUI MODEL PBL DI SMP
Maxwell Ompusunggu ..... 657 - 663

PENGEMBANGAN LKPD BERBASIS PJBL-STEM UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KREATIF MATEMATIS PADA SISWA SMA NEGERI 1 DELI TUA
Dinda Riski Aulia, Asrin Lubis ..... 664 - 673

THE APPLICATION OF PROBLEM BASED LEARING BY USING LIVE WORKSHEET WEBSITE TO IMPROVE PROBLEM SOLVING SKILL IN LEARING QUADRATIC EQUATION IN CLASS IX STUDENTS OF SMPN 1 GALANG
Erwin Syahputra, Waminton Rajagukguk ..... 674 - 682

PENGEMBANGAN BAHAN AJAR BERBASIS CASE METHOD BERBANTUAN ANDROID UNTUK MENINGKATKAN KEMAMPUAN PEMAHAMAN MATEMATIS SISWA KELAS X SMA
Hidayah Tia Azriani Nasution, Tiur Malasari ..... 683 - 692

PENGEMBANGAN MEDIA PEMBELAJARAN DIGITAL BERBASIS ETNOMATEMATIK BATAK DENGAN MODEL PBL UNTUK MENINGKATKAN KEMAMPUAN LITERASI MATEMATIS SISWA SMPN 3 KISARAN
Putri Ardhanita Harahap, Muhammad KMS Amin Fauzi ..... 693 - 701

PENGARUH MODEL PEMBELAJARAN KOOPERATIF TIPE *TWO STAY TWO STRAY* TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA DI SMA NEGERI 7 MEDAN
Sarah Maulida Siahaan, Asmin ..... 702 - 710

PENERAPAN MODEL PEMBELAJARAN SEARCH, SOLVE, CREATE, AND SHARE UNTUK MENINGKATKAN KEMAMPUAN BERPIKIR KREATIF MATEMATIS SISWA KELAS X DI SMA NEGERI 1 DELI TUA
Mia Rizki Idaroyanni Siregar, Dian Armanto ..... 711 - 718

PENGARUH MODEL PEMBELAJARAN PBL TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA KELAS X SMA NEGERI 2 PANGURURAN
Arie O. Situngkir ..... 719 - 727

PENERAPAN MODEL PEMBELAJARAN *DISCOVERY LEARNING* BERBANTUAN APLIKASI GEOGEBRA UNTUK MENINGKATKAN PENALARAN MATEMATIS SISWA KELAS VIII SMP
Robby Rahmatullah, Izwita Dewi ..... 728 - 737

PENGEMBANGAN BAHAN AJAR MATEMATIKA BERBENTUK VIDEO PEMBELAJARAN ANIMASI BERBASIS *PROBLEM BASED LEARNING* UNTUK MENINGKATKAN KEMAMPUAN KOMUNIKASI MATEMATIKA SISWA SMA KELAS X
Mayana Angelita Tambunan, Nurliani Manurung ..... 738 - 746

EFEKTIVITAS PEMBELAJARAN DARING MENGGUNAKAN MEDIA ONLINE SELAMA PANDEMI COVID – 19 (STUDY KASUS BELAJAR MATA PELAJARAN MATEMATIKA KELAS VIII SMPN 35 MEDAN)
Ulinsyah, Syawal Gultom ..... 747 - 752

PENGEMBANGAN E-MODUL BERBASIS STEAM UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VII
Anita Khofifah Ray, Kms Muhammad Amin Fauzi ..... 753 - 759

DIFFERENCES IN STUDENTS' MATHEMATICAL COMMUNICATION ABILITY USING RME APPROACH AND PROBLEM POSING APPROACH AT SMP NEGERI 1 BANDAR
Pittauli Ambarita, Hasratuddin ..... 760 - 765

ANALISIS KEMAMPUAN PEMAHAMAN KONSEP MATEMATIS DALAM MEMECAHKAN MASALAH DENGAN PENDEKATAN OPEN ENDED DITINJAU DARI KECENDERUNGAN GAYA BELAJAR SISWA SMP NEGERI 16 MEDAN
Nadya Isti Amima Siagian, Waminton Rajagukguk ..... 766 - 774

PENGARUH PENDEKATAN MATEMATIKA REALISTIK BERBANTUAN *WOLFRAM ALPHA* TERHADAP KEMAMPUAN PEMAHAMAN KONSEP MATEMATIS SISWA KELAS VIII SMP MUHAMMADIYAH 3 MEDAN .....
Majdah Luthfita, Denny Haris ..... 775 - 783

PENGARUH MODEL PEMBELAJARAN KOOPERATIF *TIPE THINK PAIR SHARE* TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA SMP
Evi Yanti P Siregar, Nurhasanah Siregar ..... 784 - 792

THE EFFECT OF THINK PAIR SHARE LEARNING MODEL ASSISTED BY WINGEOM SOFTWARE ON STUDENT'S MATHEMATICAL COMMUNICATION ABILITY IN SMP NEGERI 35 MEDAN
Dinda Apriani Hia, Pardomuan N.J.M Sinambela ..... 793 - 801

PENERAPAN MODEL PEMBELAJARAN *DISCOVERY LEARNING* UNTUK MENINGKATKAN PEMAHAMAN KONSEP MATEMATIKA
Tharisya Annida Radani, E. Elvis Napitupulu ..... 802 - 810

PENGEMBANGAN BAHAN AJAR DENGAN PENDEKATAN MATEMATIKA REALISTIK BERBASIS ETNOMATEMATIKA PADA SONGKET MELAYU DELI UNTUK MENINGKATKAN HASIL BELAJAR MATEMATIKA SISWA
Alneta Angelia Br Brahmana, Fevi Rahmawati Suwanto ..... 811 - 819

UPAYA MENINGKATKAN KEMAMPUAN KOMUNIKASI MATEMATIS SISWA MELALUI MODEL *PROBLEM BASED LEARNING* DI KELAS VIII SMP YPMA MEDAN
Irma Dwi Suryani, Mukhtar ..... 820 - 828

UPAYA MENINGKATKAN PEMAHAMAN KONSEP MATEMATIKA DENGAN MODEL PEMBELAJARAN *CONCEPTUAL UNDERSTANDING PROCEDURES* BERBANTUAN E-MODUL DI KELAS XI IPA SMAN 11 MEDAN
Indah Veronika Susanti Tarigan, Mukhtar ..... 829 - 839

PENERAPAN MODEL *PEMBELAJARAN SEARCH, SOLVE, CREATE, AND SHARE* UNTUK MENINGKATKAN KEMAMPUAN PEMAHAMAN KONSEP PADA SISWA
Mhd. Ricky Murtadha, Sri Wahyuni, Aica Wira Islami ..... 840 - 848

PENGEMBANGAN E-MODUL PEMBELAJARAN MATEMATIKA BERBASIS PENDEKATAN *REALISTIC MATHEMATICS EDUCATION* DALAM PEMAHAMAN KONSEP MATERI PELUANG
Tri Ananda Girsang, Edy Surya ..... 849 - 853

PENGARUH MODEL PEMBELAJARAN *MISSOURI MATHEMATICS PROJECT* TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIKA PADA SISWA
Dhiena Safitri, Fathul Jannah, Nur Imaniyanti ..... 854 - 861

PENINGKATAN AKTIVITAS DAN HASIL BELAJAR MATEMATIKA MATERI KOMBINATORIK MELALUI PEMBELAJARAN KOOPERATIF BERBANTUAN KOMPUTER
Fathur Rahmi ..... 862 - 873

PENERAPAN MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* BERBANTUAN GEOGEBRA UNTUK MENINGKATKAN KEMAMPUAN PEMECAHAN MASALAH SISWA KELAS VIII SMP NEGERI 6 MEDAN
Bintang Tabita Sianipar, Marojahan Panjaitan ..... 874 - 880

PENGEMBANGAN MEDIA INTERAKTIF PADA PEMBELAJARAN MATEMATIKA BERBANTUAN GEOGEBRA DENGAN PENDEKATAN STEM UNTUK MENINGKATKAN PEMAHAMAN KONSEP MATEMATIS SISWA SMP NEGERI 1 BINJAI LANGKAT
Nurul Fidiah, Kms. M. Amin Fauzi ..... 881 - 890

PENGARUH PENGGUNAAN MEDIA PEMBELAJARAN *ARTICULATE STORYLINE* 3 TERHADAP KEMAMPUAN REPRESENTASI MATEMATIS SISWA SMP
Santi Karla Silalahi, Mangaratua M. Simanjorang ..... 891 – 899

PENGEMBANGAN E-LKPD DENGAN MENGGUNAKAN WIZER.ME BERBASIS *PROBLEM BASED LEARNING* UNTUK MENINGKATKAN PEMECAHAN MASALAH SISWA KELAS VIII SMP
Sesili Andriana, Marojahan Panjaitan ..... 900 - 909

PENGARUH DISPOSISI MATEMATIS SISWA TERHADAP KEMAMPUAN KOMUNIKASI MATEMATIS SISWA SMA NEGERI 4 KISARAN
Zulaifatul Husna Br Siregar, Asmin ..... 910 - 918

PENGEMBANGAN MEDIA PEMBELAJARAN BERBASIS *VIDEO EXPLAINER* PADA POKOK BAHASAN BARISAN DAN DERET UNTUK MENINGKATKAN MINAT BELAJAR SISWA
Nova Yulisa Putri, Tiur Malasari Siregar ..... 919 - 927

PENGARUH MODEL PEMBELAJARAN KOOPERATIF TIPE *MAKE A MATCH* DAN TIPE STAD TERHADAP KEMAMPUAN PEMECAHAN MASALAH MATEMATIS SISWA KELAS VIII DI MTS YASPI LABUHAN DELI
Ismi Salwa Thohirah, Wingston Leonard Sihombing ..... 928 - 936

PENGARUH MODEL PEMBELAJARAN *PROBLEM BASED LEARNING* BERBANTUAN KAHOOT TERHADAP *COMPUTATIONAL THINKING* PADA SISWA KELAS VIII SMP NEGERI 1 BINJAI
Naomi Camelia, Erlinawaty Simanjuntak ..... 937 - 945

DEVELOPMENT OF INTERACTIVE COMICS BASED ON REALISTIC MATHEMATICS APPROACH TO IMPROVE MATHEMATICAL COMMUNICATION ABILITIES OF STUDENTS OF SMPS MUSDA PERBAUNGAN
Fitri Aulia, Asmin ..... 946 - 952

Bidang Ilmu: Matematika 953

ANALISIS PENERIMAAN E-LEARNING BERDASARKAN *TECHNOLOGY ACCEPTANCE MODEL* DENGAN PENDEKATAN *PARTIAL LEAST SQUARE - STRUCTURAL EQUATION MODELING*
Rizka Annisa Mingka, Hamidah Nasution ..... 954 - 960

IMPLEMENTASI *FUZZY GAME THEORY* DALAM MENENTUKAN STRATEGI PEMASARAN OPTIMAL (STUDI KASUS PERSAINGAN *E-COMMERCE* SHOPEE, TOKOPEDIA DAN LAZADA)
Fasya Arsita, Hamidah Nasution ..... 961 - 967

ANALISIS BIAYA SATUAN RAWAT INAP MENGGUNAKAN METODE *STEP DOWN* PADA RSUD DR. DJASAMEN SARAGIH PEMATANG SIANTAR
Inra Wisada Manurung, Nerli Khairani ..... 968 - 972

PENERAPAN METODE ASSIGNMENT HUNGARIAN DALAM MENENTUKAN PENUGASAN WAKTU KERJA PT. SINAR SOSRO
Nickie Aulia Nerti Pane, Nerli Khairani ..... 973 - 979

ANALISIS PREDIKSI HARGA EMAS BULANAN DI KOTA MEDAN MENGGUNAKAN METODE JARINGAN SYARAF TIRUAN ALGORITMA *BACKPROPAGATION*
Meisal Habibi Perangin-angin, Chairunisah ..... 980 - 987

ANALISIS FAKTOR YANG MEMPENGARUHI TINGKAT KRIMINALITAS DI SUMATERA UTARA MENGGUNAKAN METODE REGRESI DATA PANEL Ika Amelia, Faridawaty Marpaung..... 988 - 995

PENERAPAN ALGORITMA A* DALAM MENETUKAN RUTE TERPENDEK PENGAMBILAN SAMPAH DI KOTA MEDAN
Messyanti Br Simanjuntak, Faridawaty Marpaung..... 996 - 1009

METODE *SPATIAL AUTOREGRESSIVE* DALAM ANALISIS KASUS DEMAM BERDARAH DENGUE DI SUMATERA UTARA
Nabila Khairunnisa, Elmanani Simamora ..... 1010 - 1017

PENERAPAN *MINIMUM SPANNING TREE* PADA JARINGAN PIPA DISTRIBUSI AIR PDAM TIRTA BENGI DI SIMPANG TIGA REDELONG DENGAN MENGGUNAKAN ALGORITMA FLOYD-WARSHALL
Andra Febiola Nita, Faridawaty Marpaung..... 1018 - 1024

PREDIKSI JUMLAH KEMISKINAN DENGAN MENGGUNAKAN METODE JARINGAN SYARAF TIRUAN *BACKPROPAGATION*
Ceria Clara Simbolon, Chairunisah..... 1025 - 1031

IMPLEMENTASI METODE *ANT COLONY OPTIMIZATION* PADA PENCARIAN RUMAH SAKIT TERDEKAT BERBASIS ANDROID (STUDI KASUS: RUMAH SAKIT DI KOTA MEDAN)
Sri Utami Dewi, Dinda Kartika ..... 1032 - 1037

IMPLEMENTASI *FUZZY TIME SERIES MARKOV CHAIN* PADA PERAMALAN NILAI TUKAR RUPIAH TERHADAP DOLAR US
Mita Cahyati, Chairunisah..... 1038 - 1043

PERBANDINGAN METODE *DOUBLE EXPONENTIAL SMOOTHING BROWN* DENGAN *TRIPLE EXPONENTIAL SMOOTHING BROWN* PADA PERAMALAN JUMLAH PENDUDUK DI KABUPATEN DELI SERDANG
Agnes Anastasia, Chairunisah ..... 1044 - 1049

ANALISIS KESTABILAN DARI MODEL MATEMATIKA UNTUK PENYEBARAN PENYAKIT CORONAVIRUS (COVID-19)
Wulan Larassaty, Yulita Molliq Rangkuti ..... 1050 - 1054

IDENTIFIKASI AUTOKORELASI SPASIAL MENGGUNAKAN *GEARY'S RATIO* PADA JUMLAH PENGANGGURAN DI SUMATERA UTARA
Hanna Gabriel Srirani Manurung, Hamidah Nasution ..... 1055 - 1059

PEMBANGKITAN ORNAMEN (GORGA) BATAK SIMALUNGUN MENGGUNAKAN *GRAPHICAL USER INTERFACE* MATLAB DENGAN MEMANFAATKAN GRUP *FRIEZE* DAN GRUP KRISTALOGRAFI
Marlina Sinaga, Dinda Kartika ..... 1060 - 1067

PENERAPAN ALGORITMA KOLONI LEBAH PADA PENJADWALAN PERAWAT DI RUMAH SAKIT UMUM PUSAT H. ADAM MALIK
Novita Karnya Situmorang, Faiz Ahyaningsih ..... 1068 - 1072

OPTIMALISASI WAKTU NYALA LAMPU HIJAU MENGGUNAKAN FUZZY LOGIC PADA PERSIMPANGAN JALAN SISINGAMANGARAJA-JALAN TURI KOTA MEDAN
Jimmi Parlindungan Manalu ..... 1073 - 1082

ANALISIS SISTEM ANTRIAN PADA TELLER BANK MANDIRI KCP MEDAN LETDA SUJONO DENGAN MENGGUNAKAN MODEL ANTRIAN *MULTI CHANEL SINGLE PHASE*
Lowis Fernando Sitorus, Abil Mansyur ..... 1083 - 1088

IMPLEMENTASI *GAME THEORY* DAN *MARKOV CHAIN* DALAM MENENTUKAN STRATEGI PEMASARAN SERTA PERPINDAHAN PELANGGAN APLIKASI *STREAMING* MUSIK
Intan Siagian, Marlina Setia Sinaga ..... 1089 -1095

OPTIMALISASI HASIL PANEN PADI BERDASARKAN KOMBINASI PUPUK MENGGUNAKAN METODE *FUZZY GOAL PROGRAMMING* (STUDI KASUS DINAS PERTANIAN KABUPATEN TAPANULI UTARA)
Ima Uli Sri Natasya Sitompul, Hamidah Nasution ..... 1096 - 1106

PERBANDINGAN METODE NAIVE DAN METODE *A-SUTTE INDICATOR* DALAM MERAMALKAN JUMLAH PRODUKSI PADA CPO (STUDI KASUS: PT. BINA PITRI JAYA)
Endang, Didi Febrian ..... 1107 - 1116

PERBANDINGAN MODEL GREY MARKOV (1,1) DAN MODEL SARIMA DALAM PERAMALAN PENJUALAN ROTI (STUDI KASUS : UD SELINA BAKERY)
Ezra Yolanda Siregar, Hanna Dewi M. Hutabarat ..... 1117 - 1124

BILANGAN DOMINASI SIMPUL DAN BILANGAN DOMINASI SISI PADA GRAF POT BUNGA (CmSn)
Desi Fitrahana Rambe, Mulyono ..... 1125 - 1133

KAJIAN METODE ZILLMER DALAM MENGHITUNG NILAI CADANGAN PREMI PADA ASURANSI JIWA SEUMUR HIDUP
Ade Sonia Putri, Sudianto Manullang ..... 1134 - 1137

OPTIMALISASI PENJADWALAN SHIFT KERJA PERAWAT DAN BIDAN DI RUMAH SAKIT UMUM DAERAH TAPANULI TENGAH MENGGUNAKAN ALGORITMA GENETIKA
Wardatul Ilma Pasaribu, Faridawaty Marpaung ..... 1138 - 1143

TRANSPOSE MODUL PROJEKTIF RELATIF TERHADAP MODUL BAGIAN TAKPROJEKTIF
Yudi Mahatma, Ibnu Hadi, Sudarwanto ..... 1144 - 1146

PENERAPAN GRAF KOMPATIBEL PADA PENENTUAN WAKTU TUNGGU LAMPU LALU LINTAS DI BEBERAPA PERSIMPANGAN KOTA MEDAN
Aisyah Nuri Sabrina, Mulyono ..... 1147 - 1152

PENERAPAN ALGORITMA BELLMAN-FORD UNTUK MENENTUKAN LINTASAN TERPENDEK DALAM PENDISTRIBUSIAN BARANG PADA PT. GLOBAL JET CARGO (J&T CARGO)
Enzel Sri Ulina Br. Ketaren, Faridawaty Marpaung ..... 1153 - 1163

PERAMALAN *CRUDE PALM OIL* MENGGUNAKAN METODE *SEASONAL AUTOREGRESSIVE INTEGRATED MOVING AVERAGE* PADA PT. GRAHADURA LEIDONG PRIMA
Putri Novianti, Tri Andri Hutapea ..... 1164 - 1168

SISTEM PENDUKUNG KEPUTUSAN DALAM PEMILIHAN *OUTLET BUBBLE DRINK* TERBAIK DI KOTA MEDAN DENGAN METODE *SIMPLE ADDITIVE WEIGTING*
Tenri Musdalifah, Arnah Ritonga ..... 1169 - 1174

***MULTI ATTRIBUTE DECISION MAKING* DALAM MENENTUKAN APLIKASI BELANJA ONLINE TERBAIK DENGAN METODE *ANALYTICAL HIERARCHY PROCESS* (STUDI KASUS: MAHASISWA MATEMATIKA UNIMED 2019-2022)**
Crish Evanggelyn Siboro, Lasker Pangarapan Sinaga ..... 1175 - 1184

MODEL REGRESI *ROBUST* TINGKAT PENGANGGURAN DI INDONESIA DENGAN MEMBANDINGKAN PEMBOBOT *TUKEY BISQUARE* DAN *WELSCH*
Thasya Febrianti Sitinjak, Hanna Dewi M. Hutabarat ..... 1185 - 1192

OPTIMASI PORTOFOLIO SAHAM PADA SUBSEKTOR PERBANKAN MENGGUNAKAN *CAPITAL ASSET PRICING MODEL*
Audrey Amelia Pardede, Hamidah Nasution ..... 1193 - 1198

Bidang Ilmu : Ilmu Komputer 1199

IMPLEMENTASI ALGORITMA *K-NEAREST NEIGHBOR* UNTUK KLASIFIKASI PENERIMA BEASISWA PROGRAM INDONESIA PINTAR (STUDI KASUS : SMAN 1 PEMATANGSIANTAR)
Edward Anggiat Maju Simanjuntak, Susiana ..... 1200 - 1211

IMPLEMENTASI ALGORITMA *NAÏVE BAYES CLASSIFIER* PADA KLASIFIKASI PENDUDUK MISKIN (STUDI KASUS: DESA TEMBUNG)
Gabriel Christian, Susiana ..... 1212 - 1223

DETEKSI EMOSI MANUSIA BERDASARKAN REKAMAN SUARA MENGGUNAKAN PYTHON DENGAN METODE MFCC DAN DTW-KNN
Siti Khuzaimah, Hermawan Syahputra ..... 1224 - 1229

PENERAPAN METODE WASPAS DALAM PENERIMA BANTUAN LANGSUNG TUNAI-DANA DESA (BLT-DANA DESA) (STUDI KASUS: DESA HUTA LIMBONG KECAMATAN PADANGSIDIMPUAN TENGGARA)
Yolanda Feby, Arnita ..... 1230 - 1237

PERAMALAN PERSENTASE PENDUDUK MISKIN PROVINSI SUMATERA UTARA MENGGUNAKAN METODE *LONG SHORT TERM MEMORY*
Nazifatul Fadhilah, Arnita ..... 1238 - 1245

PEMETAAN TINGKAT PENGANGGURAN DI PROVINSI SUMATERA UTARA MENGGUNAKAN SISTEM INFORMASI GEOGRAFIS DENGAN METODE K-MEDOIDS
Wirda Silvia Rambe, Arnita ..... 1246 - 1256

THE EFFECT OF THINK PAIR SHARE LEARNING MODEL ASSISTED BY WINGEOM SOFTWARE ON STUDENT'S MATHEMATICAL COMMUNICATION ABILITY IN SMP NEGERI 35 MEDAN

Dinda Apriani Hia[1*], Pardomuan N.J.M Sinambela[2]

Department of Mathematics,Faculty of Mathematics and Natural Sciences,Universitas Negeri Medan, Medan, Indonesia
Email : dindahia127@gmail.com

Abstract

The purpose of this research is to find out whether there is an influence of the Think Pair Share Model Assisted by Wingeom Software on the Mathematical Communication Skills of Students at SMP Negeri 35 Medan. This research uses quantitative research methods. The research population was all class VII students at SMP Negeri 35 Medan. The sample class was selected by random sampling. The sample class, namely class VII-4 as the experimental class, is taught using the Think Pair Share (TPS) learning model assisted by Wingeom, while class VII-5, the control class, is taught using the conventional learning model. The results of the research looked at the value (sig) and posttest, so that the value of mathematical communication skills (sig) < 0.05 or 0.00 < 0.05. By showing an average posttest score for mathematical communication skills of 80.31 > 64.44. So it can be concluded that these results show that there is a significant influence of the Think Pair Share learning model assisted by Wingeom software on the mathematical communication skills of students at SMP Negeri 35 Medan.

Keywords*: Think Pair Share Learning Model, Wingeom Software, Student's Mathematical Communication Abilities.*

1. INTRODUCTION

According to Maryunah et al. (2019), education is a crucial element in the formation and development of the quality of human resources needed to deal with the current situation. As stated in National Education System Law No. 1 of 2003, education is defined as: "A conscious and planned effort to create a learning environment and learning process so that students effectively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed himself, the people of the nation, and the state. According to article 4, students are members of society who work to realize their potential through learning processes that are accessible through specific educational paths, levels, and types. The low quality of education at every level of the educational system is one of the issues Indonesians have with education. As a result, better human resources are generated the higher the quality of education. Whereas improving the quality of human resources depends heavily on education quality.

The purpose of education is to produce people who have faith in and are devoted to God Almighty, who are healthy, intelligent, have feelings, are willing, and are able to work; who are able to meet a variety of needs naturally; who are able to control their passions; who are personality, social, and cultured, according to Law No. 20 of 2003. The implication is that education must help people realize (develop) their varied potentials in the context of diversity, morality, individuality/personality, sociality, and culture as a whole. In order to demonstrate how Indonesian national education prioritizes attitudes toward development, character, and changes in the philosophical ideals of the Indonesian state, the educational goals that have been stated. This attempts to strengthen nationalism and prepare for worldwide competition.

There are numerous issues in the area of education. The learning process in the classroom in Indonesia is still overly dominated by the instructor (teacher centered), as mentioned (Gultom, 2017). In this lesson, the teacher only explains the material, then gives examples of questions, then gives practice questions that must be completed in a manner similar to the sample questions, and finally gives home assignments at the conclusion of the lesson. As a result, students only learn how to solve routine questions, which means that their ability to communicate with one another is also less developed. Along with the reasoning process behind information acquisition, the introduction, understanding, and training of methods or ways of functioning are equally crucial concepts to teach in the teaching and learning process (Siahaan, 2014). Therefore, the core of the entire educational process is the teaching and learning process. While students are encouraged to participate in learning activities, teachers have obligations, responsibilities, and teaching efforts.

The teaching process is a step that the teacher takes with the pupils and has a big impact on how they develop. Students will feel at ease and engaged in their study if the procedure runs well. In contrast, if the learning process is repetitive, pupils are more likely to become apathetic and bored (Sembiring & Siregar, 2020). Along with the reasoning process behind information acquisition, the introduction, understanding, and training of methods or ways of functioning are key topics to teach in the teaching-learning process (Siahaan, 2014). Therefore, the learning process needs to be carried out optimally in all subjects, including in learning mathematics.

The science of mathematics has contributed significantly to the advancement of contemporary technology and is still expanding. Therefore, as stated in the Education Unit Level Curriculum (BNSP, 2014), mathematics is one of the requirements that must be satisfied in order to grasp advanced technology in the world of education. Mathematics is a universal science that serves as the foundation for the development of modern technology, has a crucial role in various scientific fields, and accelerates human thought. The current advancements in mathematics in the areas of number theory, algebra, probability, and discrete theory are the foundation for the quick development of information and telecommunications technology. Future technological design and mastery require strong mathematical foundations from a young age. Fowler contends that because mathematics is an abstract subject, teachers need to be able to find the most effective approach based on their students' degree of mental maturity (Suryati & Krisna, 2021).

The significance of teaching pupils maths, in accordance with According to Cockroft, pupils should learn mathematics for the following reasons: (1) It is always applied to real-world situations; (2) It is necessary for success in all academic fields; (3) It is a powerful, succinct, and understandable tool; (4) It can be used to present information in a variety of ways; (5) It enhances one's capacity for accurate reasoning and spatial awareness; and (6) It provides satisfaction for one's efforts to solve difficult problems. Even though teachers frequently give students questions that differ greatly from the examples of questions they have previously been taught, many students still believe that mathematics is difficult, despite how important it is for them to learn (Abdurrahman, 2018). Martin asserted that although though math is thought to be highly tough, everyone has to understand it because it may be used to address difficulties in daily life. In order to solve these issues, one must have information, understanding of sizes and forms, counting skills, and most importantly, the capacity to recognize and apply preexisting correlations (Sundayana, 2014). According to Sholeh et al. (2021) Indonesia continues to rank 49 out of 53 TIMSS participants, while in the 2015 Program for International Students Assessment (PISA) report, the country is ranked 63 out of 70 countries for mathematics, with a score of 386 out of a total of

540,000 students (TIMSS, 2015). This demonstrates that Indonesia still has relatively low math success levels. The 2013 Curriculum's goals for math education are for pupils to be able to observe, inquire, experiment, reason, present/communicate, and create. Students must therefore master three areas, namely cognitive, affective, and psychomotor, in order to attain the aims of studying mathematics.

Mathematical communication is a way for students to express mathematical ideas both orally, in writing, drawing diagrams, using objects, presenting them in algebraic form, or using mathematical symbols." In order to solve practical issues that are directly tied to mathematical symbols that are crucial to understand, mathematical communication is crucial. Students' mathematical communication abilities can be acquired through the educational process at school, one of which is the process of studying mathematics (Hodiyanto, 2017). Mathematical communication ability is the ability of students to explain mathematical ideas both orally and in writing.

Baroody (in Hodiyanto, 2017) cites two key justifications for why communication is one of the main areas of study in mathematics: (1) The language of mathematics is fundamentally mathematics itself. Mathematics is a cognitive tool that assists us in identifying patterns, solving problems, and drawing conclusions. It also aids in the clear, exact, and concise communication of our views about a variety of topics. In reality, mathematics is seen as a language that is universal and has its own symbols and patterns. It can be used by everyone in the globe to convey mathematical information, regardless of their original tongue. (2) Teachers and students are at least two of the participants in the social activity of learning and teaching mathematics. It is crucial to use language to communicate such thoughts and ideas to others during the learning and teaching processes. This sharing of knowledge and experiences is essentially a teaching and learning process. Naturally, speaking with peers helps one improve communication skills necessary for learning to think like a mathematician and successfully solve brand-new problems.

Based on the above data, in fact many students experience difficulties in learning mathematics. Student's experience difficulties in communicating mathematical problems in the language of mathematics. Even students who are capable of learning mathematics are often less able to convey their thoughts. As if they do not want to share knowledge with others. If this is continuously allowed or ignored, students will be less able to communicate using mathematics (Mahadewi et al., 2017). According to Kadir (in Hodiyanto, 2017) explains that to reveal student's abilities in various aspects of communication, it can be done by looking at student's abilities in discussing problems and making mathematical expressions in writing either pictures, mathematical models, or symbols or their own language. In fact, the measurement of student's mathematical communication abilities is carried out by giving a score to student's ability to provide answers to questions by drawing (drawing), making mathematical expressions (mathematical expression), and writing answers in their own language (written texts). According to Firdaus research (in Sritresna, 2017), more than half of the students received a score for their ability to communicate mathematically that was less than 60% of the optimum score, indicating that their ability to communicate mathematically was not of a good quality. Students will be less able to communicate using mathematics if this is permitted to continue (Sritresna, 2017). Time and national boundaries are no longer an obstacle, especially with the current highly rapid growth of science and technology (Science and Technology), which allows information that occurs in any area of the world to be instantaneously known. Learning mathematics is regarded to foster the growth of science and technology as well as the development of problem-solving, critical thinking, creative, and communication abilities (Situmorang et al., 2018).

The Foundation in Technology for All Teachers: Foundation Standard was recommended by the International Society for Technology in Education (ISTE) in 1999. According to this requirement, teachers must: (1) Possess a general understanding and technological proficiency. (2) Having the ability to use technology to enhance skills in both the professional and personal spheres. (3) Must have the ability to successfully incorporate technology into the curriculum.

According to the aforementioned research, it takes work from subject teachers to adopt cooperative learning and make students more engaged in learning, communicating, and developing their own self-confidence. Small groups of students work together in cooperative learning to make the most of teaching and learning conventions. The ability of pupils to communicate mathematically is another benefit of cooperative learning. In this approach, students are required to form groups and dare to express their own viewpoints.

The Think Pair Share learning paradigm is one of numerous cooperative learning strategies that can be applied to the learning of mathematics. Frank Lyman and associates at the University of Maryland created the Think Pair Share Learning Model for the first time in 1981 (Kaddoura, 2013). In a cooperative learning strategy called "Think Pair Share," students independently evaluate the problems the instructor presents, then talk about the problems with a partner and offer their conclusions to their classmates (Dol, 2014). Because communication skills will be more motivated in the Think Pair Share learning model and because using this learning model will make students more open to communicating with their peers because they won't feel as awkward with the teacher when discussing with friends, this learning model can help students find and understand mathematics learning materials. Students will have the chance to debate with

others and with themselves thanks to Think Pair Share. This method shines at assisting pupils in identifying their critical thinking abilities and capacity to support friends when they discuss a topic. Giving pupils the chance to talk to one another will provide them the space they need to disclose their struggles and the knowledge they need to assist those in need. Students will benefit from this situation in order to better understand the subject matter. The Think Pair Share model can provide students more time to think, respond, and assist one another while also identifying patterns of student interaction (Rozak and Qohar, 2021). Students won't become confused in class as a result of short-cut learning procedures, which will make it simpler for the teacher to place them in the appropriate groups and prevent confusion among the students. TPS is incredibly useful when used in learning, as demonstrated by this practice.

The learning process that allows explore students' mathematical communication skills but also provides a large scope for the students themselves in managing and managing themselves will be more fun and effective because students have scope for themselves and then refined with the results of discussions with friends. Help obtained from peers will help students at the right time. The knowledge of the students' buddies will cover their gaps in understanding, and if this duo is unable to do so, a bigger discussion—namely, the class—is available and will be able to address their issues. Students will learn about this incident through the Think Pair Share learning technique, which will make it simpler for them to comprehend the mathematical concepts that the teacher is teaching. Students must make an effort to comprehend the concepts on their own and find solutions to the challenges they encounter during the stages of the think pair share learning approach. And then share with a group of friends, and try in each group to find a solution, and if there are obstacles that are difficult for them to face, the teacher provides assistance to students. A scientific approach will help students to work more on their own abilities, and regulate their own abilities and improve their ability to communicate with the challenges they face. Students will find it simpler to recall procedures like this because they typically come up with their own answers to problems.

Another way for teachers to plan and use is to use technology. The type of technology that will be used is with the help of the Wingeom Software. Pratiwi and Septia (2016) describe Wingeom Software as a dynamic mathematics program made specifically for studying geometry. Both the Wingeom-2 dim program for geometry in two dimensions and the Wingeom-3 dim program for geometry in three dimensions are included in the program. Students can investigate, observe, create form animation, and present dimensional geometry material using the Wingeom application. Meanwhile, Wingeom is software designed exclusively to depict geometric materials, according to Rhosyida (2015). Therefore, using the Wingeom program to learn geometry and solve geometry-related problems is a possibility. This application is particularly useful for creating 2D geometry lessons that are interactive and allow for student exploration. To put it another way, students use the Wingeom application as Mindtools (thinking aids) to create their own knowledge. Wingeom's benefits (Rhosyida, 2015) in dynamically presenting geometric shapes in two and three dimensions are anticipated to be able to assist students in gaining a more thorough and practical grasp of geometry.

According to the findings of interviews done by researchers with math teachers at SMP Negeri 35 Medan, learning generally occurs utilizing traditional learning paradigms, which are still student-centered. The student's active participation is still low in terms of asking directly to the teacher, responding to questions, expressing opinions or ideas, and discussing with other students. Learning models that are still lacking in the learning process, particularly learning processes that do not use technology or mathematical software, are also still lacking.

According to the definition given above, a study with the following title must be conducted by the researcher: “The Effect of Think Pair Share Learning Model Assisted by Wingeom Software on Student’s Mathematical Communication Ability in SMP Negeri 35 Medan”.

2. RESEARCH METHOD

This type of research uses this type of research as quantitative research, as stated by Sugiyono (2015) that "Quantitative research method is a research method based on the philosophy of positivism, used to examine certain populations or samples, sampling techniques are generally carried out randomly , data collection uses research instruments, data analysis is quantitative/statistical in nature with the aim of testing the established hypotheses”. This research is a quasi-experimental research, using quantitative data analysis. The design of this study uses the Non-Equivalent Control Group Design which is used to determine the effect of the think pair share model on mathematical communication skills. This research consists of one independent variable (idependent) and one dependent variable (dependent). The independent variable is the Think Pair Share Model, while the dependent variable is mathematical communication skills. Then the research design uses the Non-Equivalent Control Group Design. In this design, there were two groups of subjects, one group received treatment (experimental class) and one group as the control class. This research was conducted at SMP Negeri 35 Medan, located at Jalan Williem Iskandar Ps. V, Kenangan Baru, Kec. Percut Sei Tuan, Kabupaten Deli Serdang, Sumatera Utara. The research was carried out in the even semester of T.A. 2022/2023.

The population in this study were all class VII students of SMP Negeri 35 Medan. The sampling technique in this study was random sampling, namely 1. Class I was given the pursuit of the Wingeom-assisted Think Pair Share model in class VII of junior high school which was called the experimental class. 2. Class II was given the conventional teaching model (direct learning model) in class VII junior high school which was called the control class. Before the test is used on the sample, it is tested first to check the validity, reliability, level of difficulty and differentiating power. After the test, the validator who is a mathematics teacher at SMP Negeri 35 Medan and 2 lecturers majoring in mathematics at Medan State University is to find out whether the questions used have fulfilled the indicators and goals to be achieved. The data analysis technique used is the F test (ANOVA) using a one party test. The data were obtained from the results of the Pretest and Posttest of the mathematical communication ability of the sample by administering a test that was carried out at the end of the subject matter being studied. The things that are done in data collection are as follows: observation and tes.

3. RESULT AND DISCUSSION

The purpose of this study was to identify whether there is an influence of the Think Pair Share learning model assisted by Wingeom software on the mathematical communication skills of students at SMP Negeri 35 Medan.

Mathematical communication is a way for students to express mathematical ideas both orally, in writing, drawing diagrams, using objects, presenting them in algebraic form, or using mathematical symbols. Mathematical communication is very important in solving real problems that are closely related to mathematical symbols that are important to interpret. Mathematical communication ability is the ability of students to convey mathematical ideas both orally and in writing, students' mathematical communication skills can be developed through the learning process at school, one of which is the process of learning mathematics (Hodiyanto, 2017). An example of the use of communication skills in everyday life is the ability of students to restate important information from word problems in the form of tables, diagrams and so on which contain real problems (drawing). Then the students' ability to connect and express real (contextual) situations in the form of story problems into mathematical models (Mathematical Expression) and explain answers to problems in story questions that contain real problems in their own language (Written Text). Mathematical communication is defined as a way for students to explain algorithms and ways to solve problems, construct and explain presentations of real world phenomena graphically, words/sentences, equations, tables and presentations. physically or how to provide conjecture about students' geometric drawings.

From the description of the learning process in the experimental and control classes above, it can be seen that the mathematical communication abilities of students taught by Wingeom-assisted Think Pair Share learning are higher than conventional models. In addition, when viewed from each indicator of mathematical communication ability, the average score of the experimental class taught by Wingeom-assisted Think Pair Share learning was also higher than the average score of the control class taught by the conventional model. For more details, it can be seen from the student posttest answer sheet as follows.

Written Text

Written Text is an indicator that has the largest average score difference between the experimental class and the control class, namely 16.21. Differences in students' mathematical communication abilities on the writing indicator can be seen on the student's posttest answer sheet as follows.

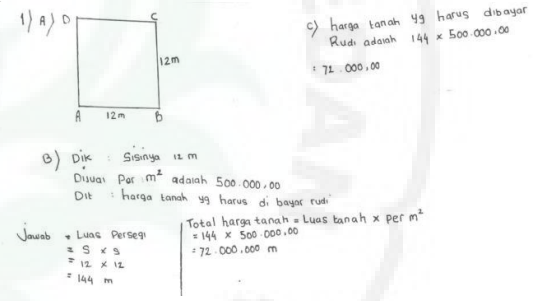


Figure 1. Students' posttest answer sheet of experimental class on writing indicator.

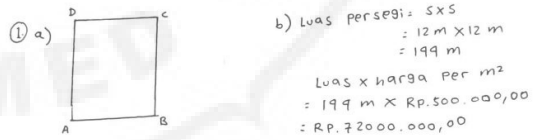


Figure 2. Students' posttest answer sheet of control class on writing indicator.

Based on Figure 1. and Figure 2. above, it is known that students in the experimental class were able to fulfill the writing indicator by providing written arguments for answers according to the demands put forward in the questions, namely students giving an explanation that the land price that Rudi has to pay if every day the per meter is 500 thousand is 72 million . Whereas in the control class, students were unable to meet the writing indicators like students in the experimental class, it can be seen that there were still students in the control class who only gave correct final results, and also did not provide answers as shown in Figure 1.

Drawing

In the indicator drawing there is also a difference in the average score of mathematical communication skills between the experimental class and the control class with a difference of 3.12. More

details, can be seen in the student posttest answer sheet as follows.

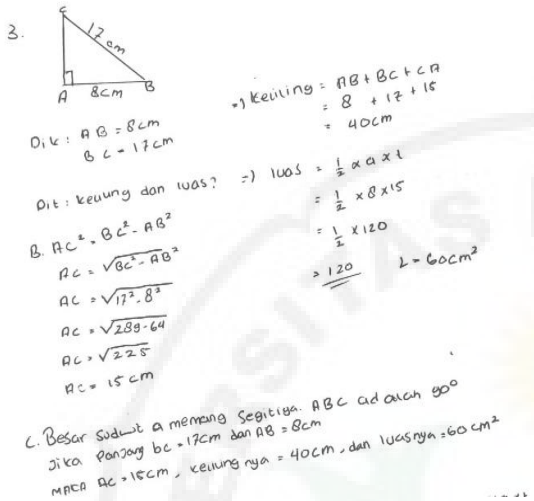


Figure 3. Posttest answer sheet of experimental class students on drawing indicators.

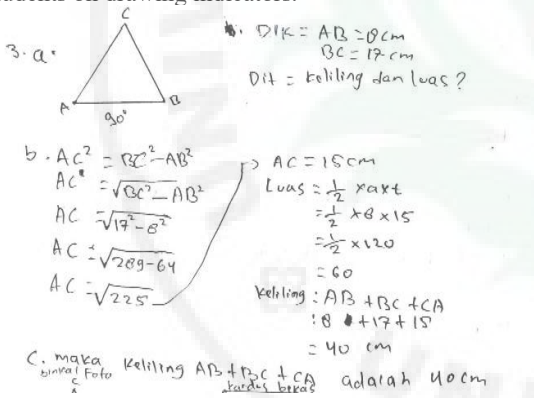


Figure 4. The posttest answer sheet for control class students is in the indicator drawing.

Based on Figure 3 and Figure 4 above it is known that students in the experimental class are able to express situations or mathematical ideas into complete and correct pictures in accordance with the demands of the problem. It is known that students in the experimental class are able to draw a right triangle with its dimensions completely and correctly. Whereas in the control class, students were unable to express mathematical situations or ideas in the form of pictures in full, but not correctly. It can be seen that the students in the control class did not draw a right-angled triangle correctly but instead drew a triangle by making 90 degrees under the triangle.

Mathematical Expression

The mathematical expression indicator also shows differences in the average scores of students' mathematical communication abilities in the experimental and control classes with a difference of 13.48. More details can be seen in the posttest answer sheet students as follows.

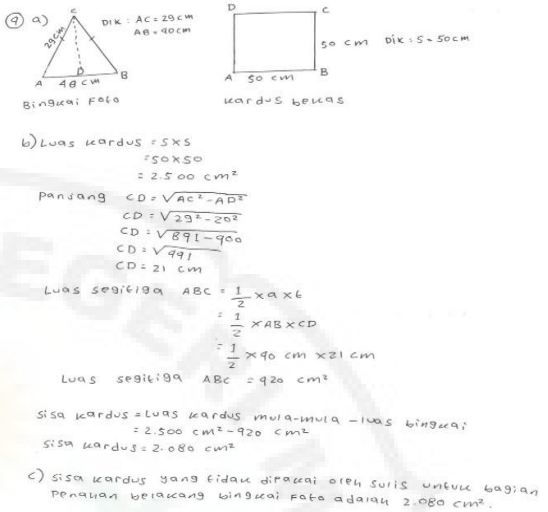


Figure 5. Posttest answer sheets for experimental class students on mathematical expression indicators

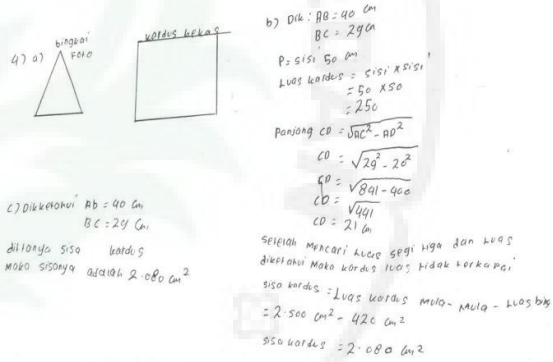


Figure 6. Posttest answer sheets for control class students on mathematical expression indicators

Based on Figure 5 and Figure 6 above it is known that students in the experimental class are able to express existing problem situations into symbols, ideas or mathematical models, in accordance with the demands of the problem. This question requires students to look for leftover cardboard that is not covered by sulis for the back support of the photo frame. Students in the experimental class were able to correctly draw a picture frame as a triangle and a cardboard file as a square. The student first looks for the initial area of the cardboard after that looks for the length of AC as the height of the triangle to be able to find the area of the triangle as the photo frame and the final step is for the student to find the remaining cardboard by subtracting the area of the original cardboard from the area of the frame. Whereas in the control class students did not find the area of a photo frame or the area of a triangle. The student immediately made the final result without first finding the area of the triangle as shown in Picture 5. This is because in the learning process the learning materials in the control class are conveyed directly, students do not build their own concepts of subject matter, but the teacher provides knowledge directly. This is in accordance with the understanding of conventional learning models,

namely learning models, where the transfer of knowledge, information, values, etc. comes from teachers to students.

The results of this study indicate that the mathematical communication abilities of students who use the Think Pair Share model are higher than those of students who study with conventional learning models, because the syntax in the Think Pair Share learning model is able to train students' mathematical communication skills. Think Pair Share will make students have the opportunity to discuss with others and discuss with themselves. This technique excels in helping students to discover critical thinking skills and the ability to help friends when they discuss a problem with each other. Providing opportunities for students to discuss with each other will provide sufficient space for students to share their difficulties. as well as the knowledge they have to help friends in need. This situation will help students understand material that they do not understand. The Think Pair Share model is designed to determine student interaction patterns and can provide more time for students to think, to respond and help each other (Rozak and Qohar, 2021). The indicators of students' mathematical communication skills in this study are also the same as research (Sahrul et al., 2020), namely writing, drawing, and mathematical expressions.

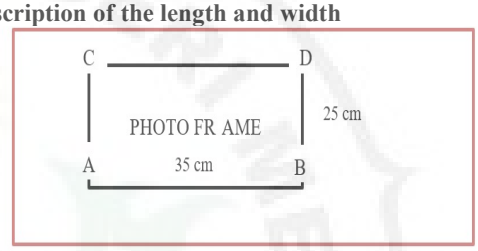
By studying mathematical communication in mathematics, students will gain ways of thinking, habits of persistence, curiosity, and confidence in unfamiliar situations. Teaching how to solve problems is a teacher's activity to provide challenges or motivation to students so that they are able to understand the problem, are interested in solving it, are able to use all their knowledge to formulate a strategy in mathematical communication, implement the strategy, and conclude it in their own language. To be able to motivate students in this way, every mathematics teacher must know and understand the steps and strategies in mathematical communication.

Wingeom software is a dynamic mathematical computer software for geometry topics. Wingeom software in mathematical communication can be used as a medium for learning mathematics to demonstrate or visualize mathematical concepts related to geometry and related to students' mathematical communication indicators on drawing or drawing indicators.

Even though there was an insignificant difference in the experimental class after being given treatment, indicator 1, namely depicting or representing real objects, pictures, and diagrams in the form of ideas or mathematical symbols, had a higher or better percentage than the control class. Likewise for the following indicators there are differences in percentage so that it can be concluded that there is an influence of the Think Pair Share model assisted by wingeom software on students' mathematical communication ability.

The use of the Wingeom Software in student mathematical communication can be seen in the way of solving one of the LAS questions below:
In the living room there is a photo frame with a length of 35 cm and a width of 25 cm. Draw an illustration of the photo frame along with its size! What is the circumference of the photo frame? Draw conclusions that you know from the question and check your answers using the Wingeom software, whether the results are the same as what you discussed!

The picture of the photo frame is complete with a description of the length and width



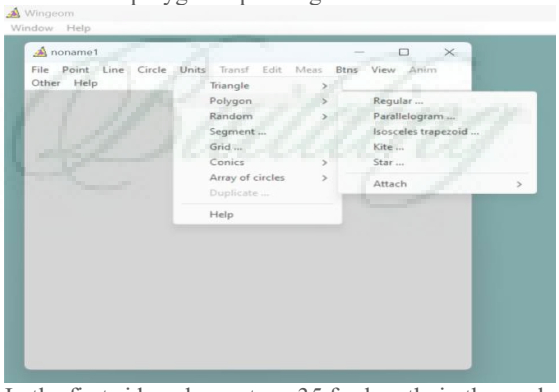
Known : length = 35 cm
Width = 25 cm
The perimeter of the photo frame is 35 cm length and 25 cm width.

Answer:
Circumference = 2 × (p + l)
Circumference = 2 × (35 cm + 25 cm)
Circumference = 2 × 60 cm
Circumference = 120 cm

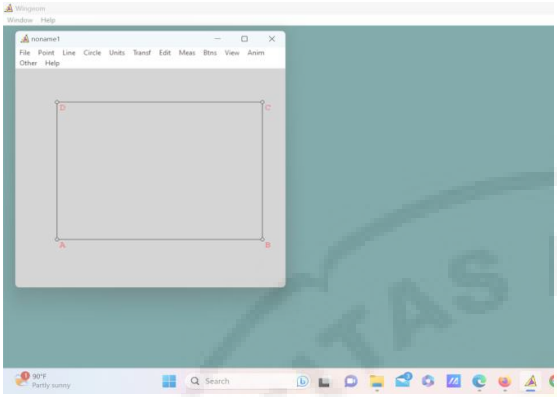
Based on the settlement results it can be concluded:

The Circumference of a photo frame with a length of 35 cm and a width of 25 cm is 120 cm

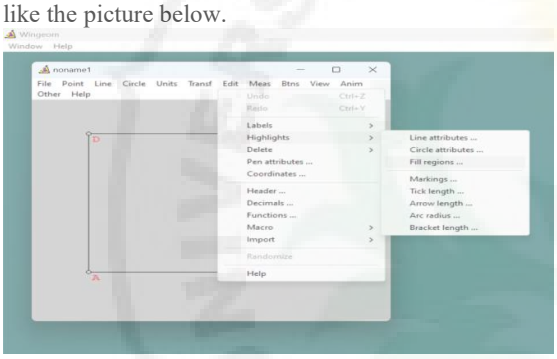
Completion in using the Software Wingeom:
Open the Sofware Wingeom
Select 2-dim means 2-dimensional
Click unit > polygon > parellogram.



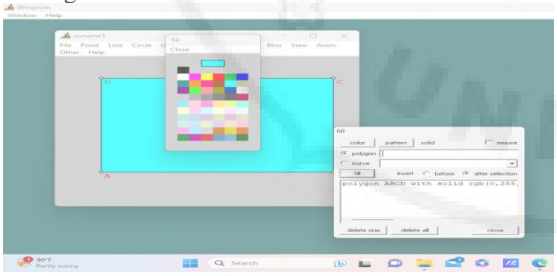
In the first side column, type 35 for length, in the angle column, type 90 for angle, and for the last side, type 25 for width. Then click ok. Then the requested rectangle will be formed.



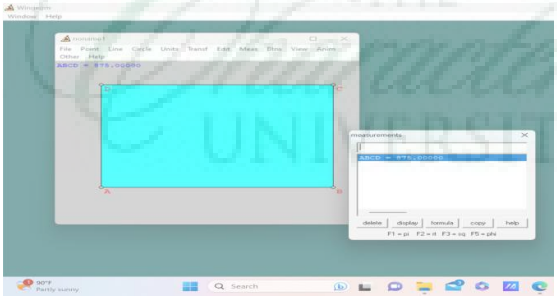
Click to color the image Edit > Highlight > fill region like the picture below.



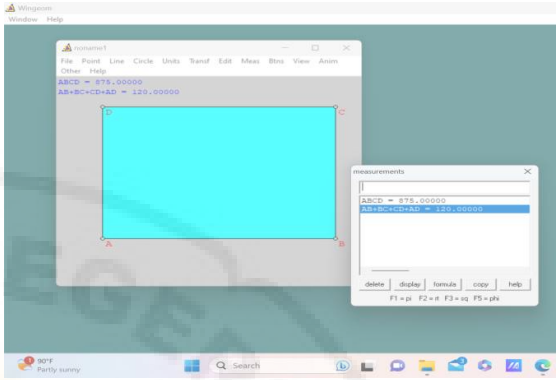
Click color, in the polygon column, type the name of the rectangle you have, namely ABCD, then click fill. Then it is obtained that the color of the ABCD rectangle is the color of Tosca as shown below.



To calculate the area of the rectangle, click Meas > then in the dialog box, type ABCD to calculate the area.



To calculate the perimeter of the rectangle, click Meas > then in the dialog box, type AB+BC+CD+DA to calculate the perimeter.



It is obtained that the area of rectangle ABCD is 875cm2. The circumference of a photo frame with a length of 35 cm and a width of a photo frame of 25 cm is 120 cm.

To achieve this goal, the researcher first conducted a pretest with the aim of knowing the initial abilities of the experimental class VII-4 and the control class VII-5. Based on the data obtained from the results of the pretest which was carried out to show that the two classes had low mathematical communication skills.

After the pretest was carried out, both treatments were applied to each sample where class VII-4 received treatment with the Think Pair Share learning model assisted by Wingeom software, and class VII-5 received conventional model treatment which was carried out by direct researchers. The learning process is carried out using the steps of the Think Pair Share learning model with as much time as possible to see how students' mathematical communication skills are. The pretest and posttest given to students have met the criteria according to the indicators of mathematical communication ability. After the treatment was carried out in each class, a posttest was carried out to see the ability of the students after being given the treatment. So that the learning outcomes in the experimental class VII-4 with the Wingeom-assisted Think Pair Share model on mathematical communication skills have an average much better than before. Whereas in the control class VII-5 with the conventional learning model, the mathematical communication ability has an average not as high as in the experimental class, it is known that there are differences in students' mathematical communication abilities as seen from the pretest and posttest results.

After calculating the average, a hypothesis test will be carried out. Before the hypothesis testing is carried out, the pretest and posttest results data that have been obtained will be tested for prerequisites first. The prerequisite tests used are normality and homogeneity tests. The normality test and homogeneity test aim to determine the hypothesis that will be used, the results of the normality test and homogeneity test on the pretest and posttest data are normally distributed.

In the hypothesis test using the one-way ANOVA test it is known that learning with the Think Pair Share learning model for communication has a

value of $F_{count} = 161.771 > F_{table} = 2.68$. After seeing the value of $F_{count} = 161.771 > F_{table} = 2.68$, $H_a : \mu_1 \neq \mu_2$ is accepted at a significance level of 0.05, the next step is to compare the posttest average values of the experimental class with the control class. For class VII-4 it is implemented using the Think Pair Share model assisted by Wingeom software, while for class VII-5 it is implemented using conventional learning which has mathematical communication skills with a good average score.

By looking at the value of F_{count} and posttest, so that the value of mathematical communication ability $F_{count} = 161.771 > F_{table} = 2.68$ it is concluded that there is a significant difference between the Think Pair Share learning model assisted by Wingeom software for students mathematical communication ability in SMP Negeri 35 Medan. By showing the posttest value of mathematical communication abilities on average 80.31 > 69.38. These results indicate that there is a significant influence of the Think Pair Share learning model assisted by Wingeom software on the mathematical communication abiliy on students in SMP Negeri 35 Medan.

4. CONCLUSION

Based on the results of the research and discussion that was carried out in the previous chapter, it can be concluded that there is an influence of the Think Pair Share learning model assisted by the Wingeom software on the mathematical communication skills of students of SMP Negeri 35 Medan. It can be seen from the SPSS test hypothesis that the value of Fcount and students' mathematical communication posttest ability is $F_{count} = 161.771 > F_{table} = 2.68$, $H_a : \mu_1 \neq \mu_2$ is accepted. By showing the posttest value of mathematical communication abilities on average 80.31 > 69.38. It was concluded that there was a significant difference between the Think Pair Share learning model assisted by Wingeom software on students' mathematical communication ability in SMP Negeri 35 Medan. Then the formulation of the problems and hypotheses proposed as well as the research results based on data analysis and hypothesis testing, the conclusions obtained in this study are that there is an effect of the Think Pair Share learning model assisted by Wingeom software on student's mathematical communication ability in SMP Negeri 35 Medan.

ACKNOWLEDGEMENT

Thank you very much to all those who have been involved in the development and dissemination of my scientific article. I'm hoping that this article will be of interest to readers and contribute to the development of science.

REFERENCE

Abdurrahman, M. (2018). *Anak Berkesulitan Belajar: Teori, Diagnosis, dan Remediasinya* (p. 254). Jakarta: Rineka Cipta.

Badan Standar Nasional Pendidikan (BSNP). (2014). *Panduan Penyusunan Kurikulum Tingkat Satuan Pendidikan Jenjang Pendidikan Dasar dan Menengah*. Jakarta: BSNP.

Dol, S. M. (2014). TPS (Think-Pair-Share): An Active Learning Strategy to Teach Theory of Computation Course. *International Journal of Information Technology and Computer Science*, *7*(9), 52–58.

Gultom, S. P. (2017). Analisis Perbedaan Kemampuan Berpikir Kreatif dan Pemecahan Masalah Matematik Antara Siswa yang Diberi Pembelajaran Open-Ended Dengan Pembelajaran Konvensional. *JURNAL Suluh Pendidikan FKIP-UHN*, *4*(2), 100–111.

Hodiyanto, H. (2017). Kemampuan Komunikasi Matematis Dalam Pembelajaran Matematika. *AdMathEdu : Jurnal Ilmiah Pendidikan Matematika, Ilmu Matematika Dan Matematika Terapan*, *7*(1), 9. https://doi.org/10.12928/admathedu.v7i1.7397

Kaddoura, M. (2013). Think pair share: A teaching learning strategy to enhance students' critical thinking. *Educational Research Quarterly*, *36*(4), 3-24.

Mahadewi, N. K. N., Ardana, I. M., & Mertasari, N. M. S. (2020). Kemampuan Komunikasi Matematis Melalui Model Reciprocal Teaching Berbantuan Media Interaktif. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *4*(2), 338-350.

Maryunah, Syahputra, E., & Fauzi, K. M. A. (2019). Peningkatan Kemampuan Komunikasi Matematis Dan Kemandirian Belajar Siswa Denga Menggunakan Model Pembelajaran Reciprocal Teaching. *Jurnal Tematik*, *9*(3), 234–245.

Pratiwi, M., Septia, T. (2016). Efektivitas Modul Aplikasi Komputer dengan Program Wingeom pada Materi Geometri. *Journal Tematik*, *3*(1), 97–107.

Rhosyida, N. (2015). *Pemanfaatan Program Wingeom Pada Pembelajaran Geometri Siswa*. 195–201.

Rozak, A., & Qohar, A. (2021). Implementation of Think Pair Share (TPS) Cooperative Learning Model to Improve Mathematical Connection Ability. *Journal of Education Research and Evaluation*, *5*(1), 87-94.

Sahrul, S., Yuanita, P., & Maimunah, M. (2020). Pengembangan perangkat pembelajaran matematika berbasis model discovery learning untuk memfasilitasi kemampuan komunikasi matematis peserta didik SMP Kelas VIII. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, *4*(2), 626-636.

Sembiring, R. F., & Siregar, R. M. R. (2020). Pengaruh Model Pembelajaran Think Pair Share (Tps) Terhadap Kemampuan Komunikasi Matematika Siswa Kelas X Sma Melati Binjai Tahun Pelajaran 2019/2020. *Jurnal Serunai*

Matematika, *12*(1), 52–59.
Sholeh, A., & Yufiarti, Y. (2021). Blended Model Personal Learning Environment (PLE) untuk Meningkatkan Pemahaman Matematika dalam Bilangan Bulat di Sekolah Dasar. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(2), 1782–1792.
Siahaan F.B. (2014). Pengaruh Model Pembelajaran Aktif Tipe Quis Team Terhadap Kemampuan Pemecahan Masalah Matematika. *JURNAL Suluh Pendidikan FKIP-UHN*, *1*(1), 35–45.
Situmorang, A. S., & Gultom, S. P. (2018). Desain Model Pembelajaran Creative Problem Solving terhadap Kemampuan Pemahaman Konsep Mahasiswa FKIP UHN. *Jurnal Penelitian Bidang Pendidikan*, *24*(2), 103–110.
Sritresna, T. (2018). Meningkatkan Kemampuan Komunikasi Matematis Dan Self-Confidence Siswa Melalui Model Pembelajaran Cycle 7E. *Mosharafa: Jurnal Pendidikan Matematika*, *6*(3), 419–430.
Suryati, K., & Dwi Krisna, E. (2021). Pendekatan Pembelajaran Matematika Realistik (PMR) Berbantuan Telegram Untuk Meningkatkan Hasil Belajar Matematika. *PENDIPA Journal of Science Education*, *5*(3), 479–485.
TIMSS. (2015). *Assessment Framework, TIMSS & PIRLS International Study Center*. Boston: Boston College.