PAPER GUIDELINES AND ABSTRACTS

ICM2E

THE 3rd INTERNATIONAL CONFERENCE ON MATHEMATICS AND MATHEMATICS EDUCATION

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PAPER GUIDELINES AND ABSTRACTS

The 3rd International Conference on

Mathematics and Mathematics Education (ICM2E 2019)

MATHEMATICS DEPARTMENT
MATHEMATICS AND NATURAL SCIENCES FACULTY
UNIVERSITAS NEGERI PADANG
AUGUST, 3rd 2019

THE COMITTEE OF INTERNATIONAL CONFERENCE ON MATHEMATICS AND MATHEMATICS EDUCATION (ICM2E 2018)
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MATHEMATICS AND SCIENCE FACULTY
UNIVERSITAS NEGERI PADANG

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Message *from the* Rector of Universitas Negeri Padang

Ladies and Gentlemen,

It gives me great happiness to extend my sincere and warm welcome to the all participants of the International Conference on Mahtematics and Mathematics Education (ICM2E 2019)

On behalf of Universitas Negeri Padang, let me welcome all of you to the conference in Padang, West Sumatra Province, Indonesia. We believe that from this scientific meeting, all participants will have time to discuss and exchange ideas, findings, creating new networking as well as strengthen the existing collaboration in the respective fields of expertise. In the century in which the information is spreading in a tremendous speed and globalization is a trend.

Universitas Negeri Padang must prepare for the hard competition that lay ahead. One way to succeed is by initiating and developing collaborative work with many partners from all over the world. Through the collaboration in this conference we can improve the quality of our researches as well as teaching and learning process in mathematics and mathematics education.

I would like to express my sincere appreciation to mathematics department on mathematics and science faculty and organizing committee who have organized this event. This is a great opportunity for us to be involved in an international community. I would also like to extend my appreciation and gratitude to keynote speakers, parallel keynote and participants of this conference for their contribution to this event.

Finally, I wish all participants get a lot of benefits at the conference. I also wish all participants can enjoy the atmosphere of the city of Padang, West Sumatra.

Thank you very much

Prof. Ganefri, Ph.D
Rector

Message *from the* Dean of Faculty of Mathematics and Science Universitas Negeri Padang

Rector of State University of Padang
Vice-Dean of Faculty, Mathematics and Science
Head of Graduate Program in Faculty of Mathematics and Science
Head of Department in Faculty of Mathematics and Science
Distinguished Keynote Speakers
Organizers of this conference
Dear participants
Ladies and gentlemen

I am delighted and honored to have this opportunity to welcome you to ICM2E 2019, which is hosted by Mathematics Department of Faculty of Mathematics and Science, Universitas Negeri Padang.

As the Dean of Faculty of Mathematics and Science, I wish to extend a warm welcome to colleagues from the various countries and provinces. We are especially honored this year by the presence of the eminent speaker, who has graciously accepted our invitation to be here as the Keynote Speaker. To all speakers and participants, I am greatly honored and pleased to welcome you to Padang. We are indeed honored to have you here with us.

The ICM2E 2019 committee has done a great work preparing this international conference and I would like to thank them for their energy, competence and professionalism during the organization process. For sure, the success I anticipate to this conference will certainly be the result of the effective collaboration between all those committees involved.

This conference is certainly a special occasion for those who work in education, mathematics, science, technology, and other related fields. It will be an occasion to meet, to listen, to discuss, to share information and to plan for the future. Indeed, a conference is an opportunity to provide an international platform for researchers, academicians as well as industrial professionals from all over the world to present their research results. This conference also provides opportunities for the delegates to exchange new ideas and application experiences, to establish research relations and to find partners for future collaboration. Hopefully, this conference will contribute for Human and Natural Resources.

I would like to take this opportunity to express my gratitude to all delegates for their contribution to the ICM2E 2019.

Thank you,

Faculty of Mathematics and Science
Dr. Yulkifli, S.Pd, M.Si

Message *from the* Chairman of Organizing Committee

First, I would like to say welcome to Padang Indonesia. It is an honor for us to host this conference. We are very happy and proud because the participants of this conference come from many countries and many provinces in Indonesia.

Ladies and gentlemen, this conference facilitates researchers to present ideas and latest research findings that allows for discussion among fellow researchers. Events like this are very important for open collaborative research and create a wider network in conducting research.

In this conference, there are about 100 papers that will be discussed from various design/development researches and about 120 participants will join this conference.

For all of us here, I would like to convey my sincere appreciation and gratitude for your participation in this conference.

Thank you very much

Dr. Dony Permana, M.Si
Chairman

The Program of the International Conference on Mathematics and Mathematics Education Padang, August 3rd 2019

Saturday (August 3rd, 2019)

No.	Time	Program	Venues	Organizer
1.	07.00 – 08.00	Registration	Lobby of Aula of FMIPA	Committee
2.	08.00 - 09.45	Opening Ceremony	Aula FMIPA of Universitas Negeri Padang	
		MC		Ronal Rifandi, M.Sc. Rara Sandhy, M.Si.
		Traditional Dance : Tari Pasambahan		Dance Team of HIMATIKA UNP
		Indonesian National Anthem		Fitri Mudia Sari, M. Si
		Welcoming Speak by Chairman		Dr. Dony Permana
		Welcoming Speak by Dean of FMIPA UNP		Dr. Yulkifli, S.Pd, M.Si
		Welcoming Speak by Rector UNP		Prof. Ganefri, Ph.D.
		Do'a		Saddam Al Aziz, M.Pd.
		Coffee Break		Committee
3.	09.45 - 11.30	Keynote Speakers: - Prof. Dr. Inge Schwank - Prof. Madya Dr. Nor'ain Mohd. Tajudin - Dr. Armiati, M.Pd Moderator : Dra. Sri Erniati, MA	Aula FMIPA of Universitas Negeri Padang	Committee
4.	11.30 - 12.45	Keynote Speakers: - Prof. Dr. Hadi Susanto - Dr. Suntaree Unhapipat Moderator : Admi Salma, S.Pd., M.Si.	Aula FMIPA of Universitas Negeri Padang	Committee
5.	12.45 - 13.45	Lunch Break	Aula FMIPA of Universitas Negeri Padang	Committee
6.	13.45 – 16.30	Parallel	Gedung Kuliah IPA Terpadu	Committee

Room 1 **Moderator : Fadhillah Fithri, M.Stat**

Location : 1st Floor IPA Terpadu Buiding, FMA06111

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Admi Salma	Universitas Negeri Padang	Structural Equation Modeling: The affecting factors of first year student'sachievement
	Atika Defita Sari	Universitas Andalas	Hierarchical Bayesian Modelling in Small Area for Estimating Binary Data
	Fitri Mudia Sari	Universitas Negeri Padang	Identification of Spatial Autocorrelation in the Poverty Level in West Pasaman Regency with Moran Index
14. 30– 15. 15	Hazmira Yozza	Universitas Andalas	Determination of Influencing Factors of Low BirthweightBabies Incidence using Logistic Regression Analysis
	Rahmatika Fajriyah	Universitas Andalas	Empirical Bayes Small Area Estimation Using Beta Binomial Models
	Fadhilah Fitri	Universitas Negeri Padang	Forecasting of Rainfall in Sumatera Barat: Singular Spectrum Analysis (SSA)Application

Structural Equation Modeling: The affecting factors of first year student's achievement

Admi Salma[1], Dina Fitria[2]

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Abstract

Grade point averages (GPA) are one of indicators student's achievement in academic. There are some factors affecting of student's achievement such as internal factors like motivation and external factors from student like parent education. That factors are unobserved variables, called latent variables. The method used is Structural Equation Modeling (SEM). It is combination from factor analysis, path analysis and regression. The aim of this research is to known the most affecting factor and its indicators from student's achievement.

Keywords : SEM, internal factors, external factors, latent variable, student's achievement

Hierarchical Bayesian Modelling in Small Area for Estimating Binary Data

Atika Defita Sari[1], FerraYanuar[2]

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Abstract

Indonesian's data are obtained from BPS from census, but census are designed for large area. Now, local goverments need to have reliable and detailed information in small area. Direct estimation areunrealible to be applied in small area because produced high mean square error (MSE). To overcome this problem, we use the indirect estimation Small Area Estimation Hierarchical Bayesian (SAE HB) with Logit Normal as the model. From this study founded that HB produced a smaller MSE than direct estimation.

Keywords Small Area Estimation, Hierarchical Bayesian, Logit Normal, Mean Square Error.

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Universitas Negeri Padang, West Sumatera Indonesia
Auditorium of Mathematics and Science Faculty, August 3rd 2019

Identification of Spatial Autocorrelation in the Poverty Level in West Pasaman Regency with Moran Index

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Abstract

West Pasaman Regency is one of the 50 largest disadvantaged regions in Indonesia. One indicator of disadvantaged areas is there are still many poor people in the area. The level of poverty in an area is estimated to be influenced by the poverty of the surrounding area. Relationships between these regions can be known by calculating spatial autocorrelation. The purpose of this study was to determine whether there is spatial autocorrelation in the poverty level in West Pasaman using the Moran Index. The results of this study indicate that there is a positive spatial autocorrelation in the poverty level in West Pasaman, but the correlation is weak because the Moran Index value is close to 0, which is 0.0765..

Keywords: Poverty Level, Moran's Index, Spatial Autocorrelation, Pasaman Barat Regency.

Determination of Influencing Factors of Low Birthweight Babies Incidence using Logistic Regression Analysis

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Abstract

Infant mortality is one indicator used to measure the quality of life of a nation. WHO stated that the main cause of infant mortality is low birthweight (LBW). Efforts to reduce the amount of LBW can be done by monitoring the factors that influence the incidence of LBW. This study aimed to identify the factors that is significantly influence the incidence of LBW in West Sumatra. The analysis was carried out by Logistic Regression Analysis on the data of maternal births domiciled in West Sumatra. It was concluded that the variables that significantly affected the incidence of LBW were maternal weight, parity, distance from previous births, problems during pregnancy, and babies' gender.

Keywords: low birthweight babies, influencing factors, logistic regression analysis, West Sumatra.

Empirical Bayes Small Area Estimation Using Beta Binomial Models

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Abstract

*SAE i*s one of the statistical methods used to construe parameters from small subpopulations. Because of that, additional information is needed to predict these parameters that will result a more accurate predictive value. *The Bayes empirical* method is a method in *SAE* that uses the Bayes method in collecting parameters, where this method can be used to process binary data by using Beta-Binomial models both theoretically and simulation data by generating data. The results showed that the Empirical Bayes estimator with the accompanying variable gave a better parameter estimation result with a smaller error squared value compared to the direct variable and Bayes estimator without concomitant.

Keywords: SAE, Empirical Bayes Method, Beta-Binomia Model

Forecasting of Rainfall in Sumatera Barat: *Singular Spectrum Analysis* (SSA) Application

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Abstract

West Sumatra has 2 peak of rainy seasons, October-November and March to May. The high intensity of rainfall causes West Sumatra has potential to floods. Precise forecasting is needed to be a reference for the government. One of the method can be used is SSA. This method is flexible because it does not require specific form of time series data, as well as parametric assumptions. Thus, accurate forecasting results is expected to be provided from the SSA method..

Keywords: Forecasting, Nonparametic, Rainfall, Singular Spectrum Analysis.

Room 2 **Moderator : Zamahsary Martha, M.Si**

Location : 1st Floor IPA Terpadu Buiding, FMA06107

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Ance Satria	Universitas Andalas	Analytical Study and Numerical Simulation of Diffusive Prey-Predator Model with Holling Type II Functional Response
	Asmiati	Universitas Lampung	Characterizing Generalized Petersen Graphs with Locating Chromatic Number Five
	Arrival Rince Putri	Universitas Andalas	Study of Some Simple Epidemic Models Stability
14.30 – 15.15	Gusrian Putra	Universitas Andalas	The Existence and Stability of Onsite Solitons in a Discrete Nonlinear Nonlocal Schrodinger Equation
	Gustia Suprika	Universitas Riau	Alternative Constructs of The Lemniscate of Bernoulli
	Helma	Universitas Negeri Padang	Factors Affecting Students' Capabilities in Analyzing by Using Flow Proof in Real Analysis Lectures
15.15 – 16.00	Khorin Latipah	Universitas Andalas	Stability Analysis of Prey-Predator Model Holling Type II with Infected Prey
	Media Rosha	Universitas Negeri Padang	Discussion of Integer Related to the Sum of Square Number that are Square Number
	Riry Sriningsih	Universitas Negeri Padang	Construction of Mathematical Models between HIV-AIDS and Lesbian, Gay, Bisexual, and Transgender (LGBT)

Analytical Study and Numerical Simulation of Diffusive Prey-Predator Model with Holling Type II Functional Response

Ance Satria [1], Arrival Rince Putri [2], Mahdhivan Syafwan[3]

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Abstract

A prey-predator model which consists of two distinct population is discussed. The model used Holling response function of type II without limiting on the growth of the prey population. Equilibrium points of the model was determined and stability of the system was analyzed by phase plane analysis. Furthermore, the model is reformulated by adding a diffusive terms to understand the spatial effect of the dynamical system behaviour. Solutions of the diffusive model were numerically illustrated with Neumann boundary conditions. Numerical simulations are presented to confirm the analytical result.

Keywords: dynamical system, prey-predator, stability, diffusive, numerical.

Study of Some Simple Epidemic Models Stability

Arrival Rince Putri [1], Riri Lestari [2]

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Abstract

The Susceptible Infected and Removed (SIR) model is extended by considering three treatments, without vaccination, vaccination in susceptible individuals, and mutation in disease viruses. Equilibrium points of those models were determined. Stability of those models was analyzed and associated with threshold parameters. Analytical result was confirmed by numerical result showing plot solution and behaviour of the system in phase plane. The results of this study inform parameters that affect stability of the system so that the best policy to prevent endemic can be proposed.

Keywords: Epidemic model, vaccination, mutation, stability, numerical.

Characterizing Generalized Petersen Graphs with Locating Chromatic Number Five

Asmiati[1], Aristoteles[2], Lyra Yulianti[3]

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Abstract

Consider $G=(V,E)$ as the given connected graph and c as the proper coloring of G using k colors $1,2,\ldots,k$ for some positive integerk.We denote $\Pi=\{C_1,C_2,...,C_k\}$ as the partition of $V(G)$, where $\boldsymbol{C_i}$ is the color class, the set of vertices that given the i-th color, for $i\in[1,k]$. For an arbitrary vertex v ∈ V(G), the color code $c_\Pi(v)$ is defined as the ordered k -tuple$\boldsymbol{c_\pi(v)=(d(v,C_1),d(v,C_2),\ldots,d(v,C_k))}$,where $d(v,C_i)=\min\{d(v,x)\mid x\in C_i\}$ for $i\in[1,k]$. If for every two vertices u,v ∈ V(G), their color codes are different, $\boldsymbol{c_\pi(u)\neq c_\pi(v)}$, then c is defined as the locatingcoloring of G using k colors. The locatingchromatic number of G, denoted by $\boldsymbol{\chi_L(G)}$, is the minimum ksuch that Ghas a locating coloring. The generalized Petersen Graph $\boldsymbol{P_{n,k}, n\geq 3, 1\leq k\leq\left\lceil\frac{n-1}{2}\right\rceil}$,consists of an outer n-cycle $\boldsymbol{u_1,u_2,\ldots,u_n}$, a set n spokes $\boldsymbol{u_iv_i, 1\leq i\leq n}$, **and** $\boldsymbol{n}$ **edges** $\boldsymbol{v_iv_{i+k}}$, with indices taken modulo n. In this paper, we characterize generalized Petersen graphs whose locating-chromaticnumber is 5.

Keywords: coloe code, locating chromatic number, generalized Petersen graph.

The Existence and Stability of Onsite Solitons in a Discrete Nonlinear Nonlocal chrödinger Equation

Gusrian Putra[1], Mahdhivan Syafwan[2], Haripamyu[3]

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Abstract

In this paper, we examine numerically the existence and stability of onsite solitons in a discrete nonlinear nonlocal Schrödinger equation. The equation interpolates cubic and Ablowitz-Ladik nonlocal equations. We obtain that the solitons are always stable for small interpolation parameter.

Keywords: existence and stability, discrete soliton, discrete nonlinear nonlocal Schrödinger equation, cubic and Ablowitz-Ladik nonlocal equations.

Alternative Constructs of The Lemniscate of Bernoulli

Mashadi[1] and Gustia Suprika [2]

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Abstract

Until now there are at least three alternative methods of constructing Lemniscate of Bernoulli. In this paper five alternative methods will be given to construct Lemniscate of Bernoulli in a simple way. Furthermore, at the end of the session will be given how to construct the incircle from Lemniscate of Bernoulli.

Keywords: Incircle, Lemniscate of Bernoulli, Curve

Factors Affecting Students' Capabilities in Analyzing by Using Flow Proof in Real Analysis Lectures

Helma

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Abstract

Real Analysis is the subjects to help the students in critical thought. Students must have the definitions and theorems to solve the problems and perform a process which is often called the preliminary analysis. After that, students construct the proof based on the preliminary analysis. Based on the characteristics of the problem in Real Analysis, the solution given to the problem is using flow proof in composing preliminary analysis. Before the learning materials are prepared, it is important to know the characteristics of learners in following the learning of mathematics that affect the learning outcomes. There are five factors that influence the learning outcomes, namely background, interest, attitude, motivation and learning styles The purpose of research is to determine the factors that influence learning outcomes. Type of this research is descriptive research. The instruments are assessment sheets for learners characteristics and test. The results is factors that influence the learning outcomes of students directly are background, attitude, motivation and learning style.

Keywords: Real analysis, proof, preliminary analysis, flow proof.

Discussion of Integer Related to the Sum of Square Number that are Square Number

Media Rosha

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Abstract

In the set of positive integers, there are so many square numbers. The square number of the number a is the result of the square of a (i.e. a2). A discussion on squared numbers is a series of squares.The sequence of square numbers 12 + 22 + ... + (n-1)2 + n2 is the sum of $\frac{1}{6}n\,(n+1)(2n+1)$. Nowadays, many discussions not only require the number of sequential square numbers. Sometimes only a number of squares are needed which may not be ordered. The geometry field addresses the number of several squares whose result is a square number, i.e. 92 + 402 = 412 and 32 + 42 + 122 = 132. This article discusses the formation of the sum of square numbers which are also square numbers.

Keyword: positive integers, square numbers

Construction of Mathematical Models between HIV-AIDS and Lesbian, Gay, Bisexual, and Transgender (LGBT)

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Abstract

Human Immuno deficiency Virus (HIV) is a virus that attacks and damages the immune system of the human body so that it is easily attacked by various diseases. A collection of diseases that attack the body is called AIDS. HIV-AIDS is very contagious and deadly. Until now, there is no medicine, serum, vaccine that can cure sufferers of the HIV virus. HIV-AIDS infection is transmitted through 3 ways: vertically (from mother to child), sexual relations (homosexual, heterosexual and transsexual), and horizontally through inter-blood contact (sharing needles together alternately, blood transfusion, etc.). Sexual intercourse is the biggest cause of transmission. This research discussed construction of mathematical models of HIV-AIDS and LGBT transmission based on the interaction between infected and susceptible individuals.

Keywords: HIV-AIDS, LGBT, mathematical models

Room 3 **Moderator : Saddam Al Aziz, M.Pd**

Tempat : 1st Floor FMIPA Terpadu Buiding, FMA06108

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Isra Nurmai Yenti	Universitas Pendidikan Indonesia	Source of Self-Efficacy for First-Year Mathematics College Students Based on Gender and Prior Knowledge
	Citra Putri Permatasari	Universitas Negeri Padang	Development of Learning Materials Based on Problem-Based Learning Model to Improve the Ability of Mathematical Problem Solving of Junior High School Students Grade VII (Preliminary Research)
	Ilyananda Putri	Universitas Negeri Padang	Development of Mathematical Learning Devices Based on Realistic Mathematics Education (RME) Approach Design Program and Creative Craft Products Class X SMK
14.30 – 15.15	Irwan	Universitas Negeri Padang	One-To-One Evaluation of Development of Learning Devices Based on the Model Eliciting Activities (MEAS) Approach to Increase Mathematical Representation Ability Student in Class X High School
	Muhammad Hafiz	Universitas Negeri Padang	The Effect of Problem Centered Learning (PCL) Approach to Critical Thinking Skills of Class XI MAS Tanah Datar District
	Neti Erawati	Universitas Negeri Padang	Preliminary Research Development of Problem-Based Learning (PBL) to Increase Mathematical Solving Ability on Compulsory Math for Students in Class X SMA/MA
15.15 – 16.00	Novrita Yuristia	Universitas Negeri Padang	The Initial Ability to Solve Mathematical Problems of Students with the Approach of Contextual Teaching and Learning Class VIII JHS.

	Ratna Juwita	Universitas Negeri Padang	Preliminary Reasearch Development of Mathematics Learning Device Based on Cognitive Conflict to Improve Critical Thinking Ability of 1st Grade Senior High School Students
	Yeni Kawarti	Universitas Negeri Padang	Development of Mathematics Learning Devices with Think Talk Write (TTW) Model Based on Scientific Approach to Improve Problem Solving Ability of Grade VII Students of Junior High School Semester I
	Novrita Yuristia	Universitas Negeri Padang	The Initial Ability to Solve Mathematical Problems of Students with the Approach of Contextual Teaching and Learning Class VIII JHS.
16.00 – 16.30	Yogi Satria Pratama	Universitas Negeri Padang	The Design of Mathematics Learning devices Based on Quantum Teaching and Learning for Student Class VIII Padang City Junior High School
	Zulfa Amrina	Universitas Bung Hatta	Development of Problem-Based Mathematic Learning Model to Improve Creative Thinking Ability of Elementary Teacher Education Students, Bung Hatta University

Source of Self-Efficacy for First-Year Mathematics College Students Based on Gender and Prior Knowledge

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Abstract

The purpose of this study was to analyze the source of self-efficacy of first-year college students based on gender and prior knowledge. Based on the descriptive research method with a sample of 67 calculus students and 58 algebra students, the results of the study were: (1) male students' self-efficacy was more influenced by mastery experience, while female students were more influenced by vicarious experience; (2) vicarious experience become the most dominant source of self-efficacy for each category from prior knowledge.

Keywords: Source of self-efficacy, gender, prior knowledge, mathematics

Development of Learning Materials Based on Problem-Based Learning Model to Improve the Ability of Mathematical Problem Solving of Junior High School Students Grade VII (Preliminary Research)

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Abstract

The problem found in the field is the students' ability to solve mathematical problems which are not optimal yet. The students' ability to solve mathematical problems can be improved by implementing learning materials based on problem-based learning model. The aim of this research is to know the process and the result of the development of learning materials based on Problem-Based Learning (PBL) in improving the students' ability to solve the mathematical problems. This research is development research by using the development model of Plomp which have three phases. They are preliminary research phase, develpment or prototyping phase, and assessment phase. In this part, it is only discussed about preliminary research. Instrument used in preliminary research are student quetionnaire, teacher interview guidline, field note, and preliminary test question sheet. The analysis result in preliminary research shows that 1) the students' mathematical ability is still low 2) the learning process that is still focused on the teacher, 3) students are less involved in the learning process 4) the learning materials used by the teacher are less facilitated students to improve mathematical problem solving ability, 5) students are difficult to understand the language used in learning resources.

Keywords: Problem Based Learning (PBL), Mathematical Problem Solving Ability, Learning Materials.

DEVELOPMENT OF MATHEMATICAL LEARNING DEVICES BASED ON REALISTIC MATHEMATICS EDUCATION (RME) APPROACH DESIGN PROGRAM AND CREATIVE CRAFT PRODUCTS CLASS X SMK

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Abstract

This research was motivated by the low communication ability of students class X SMK of design and creative products craft program. Creative design and products craft is skill program that requires graduates to compete in the workforce by producing products and then promoted for sale. This certainly requires good communication skills. Therefore, developed learning device including RPP and LKPD was developed based on the RME approach to the design program and creative craft products in class X SMK.

Keywords: learning device, RMEapproach,communication ability, SMK

ONE-TO-ONE EVALUATION OF DEVELOPMENT OF LEARNING DEVICES BASED ON THE MODEL ELICITING ACTIVITIES (MEAS) APPROACH TO INCREASE MATHEMATICAL REPRESENTATION ABILITY STUDENT IN CLASS X HIGH SCHOOL

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Abstract

The ability of mathematical representation is very important for students because it provides fluency to build a concept. In addition, the ability of mathematical representation also helps students to apply mathematics to real-life situations through modeling. This study aims to develop learning devices to improve the ability of mathematical representation based on the Model Eliciting Activities (MEAs) approach. One of the stages in the development research model who was presented by Plomp is a one-to-one evaluation. In one-to-one evaluation was nedded 3 students from low, medium and high level in class X High School. Based on data observation of the one-to-one evaluation of the learning devices developed, the data obtained are quite useful in perfecting learning devices.

Data that was obtained from observations on one-to-one evaluations are used in perfecting learning devices

Keywords: Model Eliciting Activities Approach, mathematical representation ability, Plomp model, One-to-one evaluation.

THE EFFECT OF PROBLEM CENTERED LEARNING (PCL) APPROACH TO CRITICAL THINKING SKILLS OF CLASS XI MAS TANAH DATAR DISTRICT

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Abstract

The mathematics learning outcomes of MAS students in the Tanah Datar Regency are still relatively low. This is because students who enter private schools are students who do not pass the selection in public schools, besides learning is still centered on the teacher and the lack of critical thinking skills of students is one of the obstacles that affect the low student learning outcomes. One of the efforts made to overcome this problem is to apply the PCL approach to learning. This study aims to determine the effect of the PCL approach on students' critical thinking skills, especially in line and series material. The study was conducted on two classes which were used as the experimental class and the control class. In the experimental class, the treatment of learning was given by applying the PCL approach while the control class was given treatment with conventional learning. The research data was obtained from the results of the initial ability test (pre-test) given before the sequences and series subject matter was started and the final test (post-test) was given after the PCL treatment was carried out, while the data analysis was performed using non-parametric tests because the data was not normally distributed and has a non-homogeneous variance. The results of data analysis showed that: 1) There was the influence of the PCL approach to critical thinking skills of class XI students of MAS Salimpaung, 2) Critical thinking of students with PCL approach was better than critical thinking of students taught with conventional learning in class XI MAS Salimpaung.

Keywords: *Sequences and series, Approach PCL, Critical Thinking Skills,* MAS (Private Islamic Senior High School), LKPD (student worksheet).

Preliminary Research Development of Problem-Based Learning (PBL) to Increase Mathematical Solving Ability on Compulsory Math for Students in Class X SMA/MA

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Abstract

This research discusses about the development of PBL-based mathematics learning on compulsory math for students class X. Learning devices developed in the form of Lesson Plan (RPP) and Student's Worksheet (LKPD). The development model used in this research is the Plomp model (Preliminary Research, Prototyping Phase, and Assessment Phase). This research only arrived at the preliminary research stage. Data obtained by mathematical problem solving ability of students is still low due to learning devices that do not support students to increase their problem solving skills.

Keywords: Mathematics Learning Devices, PBL Model, Mathematical Problem Solving Ability, Preliminary Research.

The Initial Ability to Solve Mathematical Problems of Students with the Approach of Contextual Teaching and Learning Class VIII JHS.

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Abstrak

Contextual Teaching and Learningis a learning concept that helps teacher associate the material they teach with the real-world situation of student which will increase learning motivation and will make the teaching and learning process more efficient and effective with its application in daily life as a family member and community. Problem solving ability is one of the most important mathematical abilities so that students are able to apply the concepts that have been learned.The purpose of this study was to determine the initial ability of mathematical problem solving with contextual questions that is class VIII JHS. The mathematical problemsolving abilities of students are seen from the indicators Problem solving ability. The instrument used in this study was in the form of a preliminary test of students' mathematical problem solving abilities with questions as many as 3 items and a study sample of 32 people.Evaluation of students' ability to solve mathematical problems based on the scoring rubric of mathematical problem solving abilities. Based on the results of this study, the percentage of students' mathematical problem solving abilities is 30.03%. The results of this study indicate the low mathematical problem solving abilities of students and the need for further action to improve it.

Keywords: Problem Solving Ability, Contextual Teaching and Learning.

Preliminary Reasearch Development of Mathematics Learning Device Based on Cognitive Conflict to Improve Critical Thinking Ability of 1st Grade Senior High School Students

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Abstract

This research discusses about the development of mathematics learning device based cognitive conflict to improve critical thinking skills of class X students. Learning device was developed in the form of Learning Implementation Plans (in the form of RPP) and Student Worksheets (SW). The model of development research that has been used in this study is the Plomp model (Preliminary Research, Prototyping Phase, and Assessment Phase). However, this research only reached to the preliminary research stage. The subject of this study was the 1st grade students of SMAN 3 Painan. Based on the results of interviews to several teachers of SMAN 2 Painan and SMAN 3 Painan concluded that the learning device used by teachers have not been able to stimulate students to think critically optimally.

Keywords: Development of Mathematics Learning, Device Based on Cognitive Conflict, Preliminary Research

Development of Mathematics Learning Devices with Think Talk Write (TTW) Model Based on Scientific Approach to Improve Problem Solving Ability of Grade VII Students of Junior High School Semester I

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Abstract

The use of learning devices helps students to be actively involved in learning activities including thinking activities, talking / discussions and activities to write down ideas or ideas. The model chosen to develop learning devices in this study is a TTW model based on scientific approaches. The tools to be developed are RPP and LKPD for first semester SMP VII students. Selection of the TTW model is based on the fact that mathematics learning outcomes are still low, because the teacher's teaching style does not vary and is not in accordance with the characteristics of students, the learning media are less fulfilling learning and learning environment that is not supportive. The RPP and LKPD developed with the TTW model provide learning experiences that involve the mental and physical processes of students so that the learning objectives of mathematics can be achieved.

Keywords: Learning Tools, Problem Solving Ability, Scientific Approach, Think-Talk-Write (TTW) Learning Model.

The Design of Mathematics Learning Devices Based on Quantum Teaching and Learning for Student Class VIII Padang City Junior High School

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Abstract

This study aims to produce learning devices in the form of RPP and LKPD based on Quantum Teaching and learning models for student class VIII Padang City Junior High School. This type of research is development research using the Plomp model consisting of three phases, namely preliminary research, prototype phase, and assessment phase. The design of learning devices is adjusted to the initial data obtained in the preliminary analysis which is then used as a guide in making the initial design of Quantum Teaching and Learning model based learning devices.

Keywords: Preliminary Research, Quantum Teaching and Learning, learning devices

Development Of Problem-Based Mathematic Learning Model To Improve Creative Thinking Ability Of Elementary Teacher Education Students, Bung Hatta University

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Abstract

This study aims at producing a problem-based valid, practical, and effective mathematic learning model to improve students' competence. The students' competence investigated included the ability to think creatively. The stages of developing a problem-based mathematic learning model consist of 1) preliminary stage, 2) prototype stage including planning, evaluation, and revision, 3) product assessment stage. The quality of problem-based mathematic learning model refers to quality criteria according to Nieveen that includes valid, practical, and effective criteria. The problem-based mathematic learning model was tested to the students of PGSD Department of FKIP, Bung Hatta University involving 30 students and 3 mathematic lecturers. The instrument used in this study consisted of 1) instrument of validity appraisal, component of learning model and toolkit, 2) instrument of practicality appraisal from students and lecturers, 3) effectiveness instrument covering test result and students' appreciation appraisal toward problem-based mathematic learning model. The result showed that problem-based mathematic learning model including syntax/learning steps, along with learning tools in term of semester learning plan and students' worksheet was considered valid, practical, and effective.

Keyword: problem-based mathematic learning, students' competence

Room 4 **Moderator : Fridgo Tasman, M.Pd.,M.Sc**

Location : 1st Floor FMIPA Terpadu Buiding, FMA 06103

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Atikah Suryani Ulfah	Universitas Negeri Padang	Preliminary Phase Research Development of Learning Device Based on Realistic Mathematics Education (RME) to Improve Mathematical Reasoning Ability Seventh Grade Students of Junior High School
	Elita Zusti Jamaan	Universitas Negeri Padang	Effect of Learning Models and Spatial Visual Intelligence to the Geometry Learning Outcomes of Junior High School Students in Padang City
	Elvi Afriani	Universitas Negeri Padang	Preliminary Research Development of Mathematical Learning Devices Based on the Contextual Teaching and Learning Approach to Increase the Mathematical Communication Ability of Students in SMP / MTS
14.30 – 15.15	Khairudin	Universitas Bung Hatta	Analysis of Self Regulated Learning Mathematics Education Students of Universitas Bung Hatta
	M. Ansyori Ridwan	Universitas Negeri Padang	Development of Mathematics Learning Device Based on Problem Based Learning (PBL) for Improvement of Students' Problem Solving Ability at Seventh Grade of Junior High School
	Misbah Ulhusna	Universitas Putra Indonesia	Ludo Game Implementation to Improve Student's Motivation and Interest to Learn Mathematics for 3rd Grade in SDN 19 Nan Sabaris
15.15 – 16.15	Rika Septia Ningsih	Universitas Negeri Padang	The Influence of the M-APOS Approach on Student Errors Based on the Newman Procedure in Class VIII SMP

	Rozalita Kurani	Universitas Negeri Padang	The Validity of the Mathematics learning based on guided inquiry to improve the mathematical communication skills of student in grade VIII of Junior high school
	Yulia Utami Putri	Universitas Negeri Padang	Validity of Mathematics Learning Device Based on The Contextual Teaching and Learning Approach in Junior High Schools
	Fridgo Tasman	Universitas Negeri Padang	Perspective Of Junior High School Teachers In Padang On Higher Order Thinking In Mathematics

Preliminary Phase Research Development of Learning Device Based on Realistic Mathematics Education (RME) to Improve Mathematical Reasoning Ability Seventh Grade Students of Junior High School

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Abstract

Based on the preliminary analysis stage conducted at SMPN 3 MuaraBungo, it is found out that the students' mathematical reasoning ability was still low and had not been maximally achieved. This is, due to one of many factors, by the lack of available learning tools that are able to facilitate the students in improving their mathematical reasoning abilities. This is what underlies the researcher to develop learning devices in the form of Learning Implementation Plans (RPP) and Student Worksheets (LKPD) based on Realistic Mathematics Education (RME) which are considered capable of providing opportunities for the students to more actively understand mathematical concepts and how to think logically and able to conclude the problem well. The purpose of this study was to obtain RME-based learning devices for grade VII of Junior High School which have valid, practical, and effective characteristics. Data was collected through observation, interviews, documentation, questionnaires, and tests of mathematical reasoning abilities. The subjects in this study were grade VII students of SMPN 3 MuaraBungo. This type of research was the research on the development of the Plomp model which consists of the preliminary research stage, the prototype development stage, and the assessment stage. However, in this paper, the researcher only explained the results of the analysis at the preliminary research stage which details the things needed to design the expected learning device. The results of the preliminary analysis were 1) the students' mathematical reasoning abilities were not optimal; 2) RPP used was not maximal in improving mathematical reasoning abilities; 3) the learning process still lacked the opportunity for the students to be more active; 4) the LKPD used had not been able to construct the students' knowledge independently and only contained formulas and sample questions.

Keywords: Learning Devices, Mathematical Reasoning, RME

EFFECT OF LEARNING MODELS AND SPATIAL VISUAL INTELLIGENCETO THE GEOMETRY LEARNING OUTCOMES OF JUNIOR HIGH SCHOOL STUDENTS IN PADANG CITY

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Abstract

Geometry learning outcomes and spatial visual intelligence are important components that must be possessed by a student, to help students solve mathematical problems, as well as everyday problems. One way to develop this is through the problem based learning (PBL) learning model with spatial visual abilities. PBL is problem-based learning, where the problem is given there are situations, facts, circumstances with the visual spatial intelligence that students have. The main problem in this study is how student geometry learning outcomes and visual spatial intelligence of class VIII junior high school students arebased on PBL learning models and students' initial mathematical abilities (KAM). This research is an experimental study. The population was VIII grade junior high school students in the city of Padang, while the sample was students of SMP 7, SMP 12, consisting of 128 students. The instruments used in this study included tests of geometric learning outcomes, tests of spatial visual abilities, and tests of early mathematical abilities. The conclusions obtained in this study are: (1) Geometry learning outcomes between students studying with problem based learning models are higher than Geometry learning outcomes of students learning with scientific learning approaches after controlling the initial mathematical abilities indicated by the results of F count 14,722> F table 4.20. (2) Geometry learning outcomes of students learning with problem based learning models with high spatial visual intelligence are higher than Geometry learning outcomes of students learning with a scientific learning approach with high spatial visual intelligence after controlling the initial ability of Mathematics shown by the results of q count = 16, 86>q table = 4.07. (3) Geometry learning outcomes between students who learn through PBL models and low spatial visual intelligence are lower than students who study with PL with low spatial visual intelligence after controlling students' initial mathematical abilities are indicated by the value of q count = 4.26> q table = 2, 97. (4). There is an interaction effect between the problem based learning model and spatial visual intelligence on Mathematics learning outcomes after controlling for the initial ability of Mathematics as indicated by the results of Fcount = 8.49> Ftable (α = 0.05) = 3.30 and Fcount = 8.49 > Ftable (α = 0.01) = 5.34.

Keywords: Learning Model, Geometry learning outcomes, Visual Spatial Test

Preliminary Research Development of Mathematical Learning Devices Based on the Contextual Teaching and Learning Approach to Increase the Mathematical Communication Ability of Students in SMP / MTs

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Abstract

This study discusses the development of mathematical learning devices based on the CTL approach to improve the mathematical communication skills of junior high school / MTs students vii. Learning tools developed in the form of Learning Implementation Plans (RPP) and Student Worksheets (LKPD). The development model used in this study is the Plomp model (Preliminary Research, Prototyping Phase, and Assessment Phase). This research only arrived at the preliminary research stage. The data obtained is that the mathematical communication skills of students are still low due to learning devices that have not supported students to improve mathematical communication skills.

Keywords: Mathematics Learning Devices, CTL Approach, Communication Ability

Analysis of Self Regulated Learning Mathematics Education Students of Universitas Bung Hatta

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Abstract

This study aimed to analyze the level of Self-Regulated Learning(SRL) on the material Differential Calculus of Mathematics Education students of Universitas Bung Hatta. This research method using descriptive qualitative method. Subjects were students taking courses Differential Calculus. To obtain research data used questionnaire instrument SRL with indicators; (1) Not dependent on the others, (2) Have confidence, (3) Conduct discipline, (4) Having a sense of responsibility, (5) Conduct on its own initiative, and (6) Exercises self-control. By taking a sample of 24 students showed that 0% is at very low , 12.5% low , 79.17% medium and 8.33% high category. While the outcomes per indicator shows that students tend to be at the low category (below 60%). These results are consistent with the interview of 6 students who have learning ability of high, medium and low. Based on these results, the necessary learning strategies on Calculus courses to improve SRL.

Keywords: SRL, Differential Calculus, Qualitative Research.

Development of Mathematics Learning Device Based on Problem Based Learning (PBL) for Improvement of Students' Problem Solving Ability at Seventh Grade of Junior High School

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Abstract

The results of literature and preliminary studies have showed that the students' problem solving abilities are still low and have not developed optimally yet. It caused learning devices are not able to facilitate, improve, and maximize the students' problemsolving ability yet though the problem solving abilities is one of important competencies in mathematics learning that have to be mastered by students. Therefore, it is designed to be a learning device based on Problem based Learning (PBL) that is expected to improve the students' problemsolving abilities. This research is a development research initiated by PLOMP. The Plomp development Model consists of three stages namely preliminary research, development stage, and assessment stage. Meanwhile, the quality of the learning devices developed must be valid, practical and effective. The data collection instruments used are questionnaire, observation sheets, interview guidelines, Field notes, and Test. The results showed that Problem based Learning (PBL) devices were valid, practical, and effective.

Keywords: Learning devices, problem based learning, problem solving abilities

LUDO GAME IMPLEMENTATION TO IMPROVE STUDENT'S MOTIVATION AND INTEREST TO LEARN MATHEMATICS FOR 3rd GRADE IN SDN 19 NAN SABARIS

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Abstract

This research is motivated by the low interest and motivation of students to learn mathematics in the third grade of SDN 19 Nan Sabaris. The purpose of this study was to see the effect of Ludo media to increase the interest and motivation of mathematics learning in third grade students of SDN 19 Nan Sabaris. This type of research is quasi-experimental with a sample of all third grade students of SDN 19 Nan Sabaris registered in the 2018/2019 school year. The research instrument used was in the form of a questionnaire to see motivation and student learning interest in mathematics in grade III of SDN 19 Nan Sabaris. The data analysis technique used is paired-sample t-test. The results of data analysis showed that there were significant differences in the results of interest in and motivation to learn mathematics in third grade students at SDN 19 Nan Sabaris. This means that the use of ludo game media can significantly increase students' interest and motivation in learning about Mathematics.

Keywords: Media, Ludo, Student's Motivation, Student's Interest.

The Influence of the M-APOS Approach on Student Errors Based on the Newman Procedure in Class VIII SMP

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Abstract

The research aims to know the application of M-APOS for overcome student's mistakes about geometry at eight grade of junior high school.M-APOS is development of APOS thery. M-APOS using ACE teaching that consist of three component: activities, classroom discussion and exercises. The subjek of research is student of VIIIA class SMP N 4 Ujungbatu in even academic year 2018/2019. The kinds of student's mistakes consist of comprehension error, process skill error, transformation error and encoding error. This reasearh design is descriptive kualitatif and the method of data collecting using test and interview. Based on the analysis of data obtained by the kind of studenterrosrC, T, P and E are 12,2%, 7,14%, 15% dan 8,47% and posttest C, T, P, and E are 83,1%, 52%, 66% dan 38,1%. So the mode of teaching can increase student learningoutcomes and decrease the student's mistakes.

Keywords: m-apos, geometry, student's mistakes.

The Validity of the Mathematics learning based on guided inquiry to improve the mathematical communication skills of student in grade VIII of Junior high school

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Abstract

Learning devices are very important equipment. the results of the observation, researchers found that mathematical communication skills were low due to lack of good learning devices. This study aims to develop a mathematical learning device based on the guided inquiry model. The results of the validity obtained by valid RPP and LKPD with a value of 3.91 and 3.56 categories were very valid. So it is concluded that the guided inquiry based mathematics learning device is valid.

Keywords: Learning devices, Mathematical communication skill, guided inquiry model.

Validity of Mathematics Learning Device Based on The Contextual Teaching and Learning Approach in Junior High Schools

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Abstract

This study aims to determine the validity of mathematics learning device based on Contextual Teaching and Learning in improving mathematical communication skills of seventh grade students of junior high school. The development models that is used is the Plomp model. The results of the validity test for the mathematical RPP based on CTL show a validity value of 3,56 with a very valid category, and for CTL based LKPD obtained a validity value of 3,52 with a very valid category.

Keywords: Validity, Learning Device, Contextual Teaching and Learning.

Perspective Of Junior High School Teachers In Padang On Higher Order Thinking In Mathematics

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Indonesia is in 65th position out of 72 countries in the report of PISA (Program for international students assessment) 2015 results. This results show mathematical abilities of Indonesian students are low. These abilities include : (1) understanding complex information; (2) theory, analysis and problem solving; (3) use of tools, procedures and problem solving; and (4) conducting an investigation. These four abilities are known as high-order thinking skills (HOTS). Similar conditions are also found Junior high school in Padang. Based on interviews with several Junior high school students in Padang, it was revealed that students were not used to solve HOTS problems. Therefore, this research interested to know about teachers perspective on HOTS. Twenty Junior High School of Mathematics teachers are tested about their perception on HOTS. This paper will report their perspective on HOTS and shows some HOTS problem that they had discuss and validated by expert.

Room 5 **Moderator : Nurul Afifah R, M.Pd**

Location : 1st Floor IPA Terpadu Buiding, FMA 06108

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Agnes Hikmatila	Universitas Negeri Padang	Development of Mathematical Learning Devices Based on Realistic Mathematics Education (RME) in Nursing Vocational School of Nursing Vocational School, Semester I
	Ali Asmar	Universitas Negeri Padang	Descriptive Student Difficulties in Analytic Geometry in Circles and Sphere Material
	Kemala Aini Y N	Universitas Negeri Padang	Development of Mathematical Learning Tool Based on Realistic Mathematics Education (RME) Approach to Art Expertise Class X Semester I Vocational School
14.30 – 15.15	Lisa Sarvita	Universitas Negeri Padang	The Developed Hypothetical Learning Trajectory For Integral Topic Which Based On Realistic Mathematics Education In The Phase of One to One Evaluation
	Miftahul Jannah	Universitas Negeri Padang	Development of High School Math Learning Devices Based on Problem Based Learning
	Minora Longgom Nasution	Universitas Negeri Padang	Development Of Understanding Of Student's Mathematical Concept Using the Stad Cooperative Learning Models Through Student's Worksheet
15.15 – 16.30	Randi Putra	Universitas Negeri Padang	Analysis of the Ability Misconception in Participants of Class Seven
	Ridia Fedistia	Universitas Negeri Padang	Advantages and Challenges of the Flipped Classroom Application – Based Learning in Enhancing 10th Grade Senior High School Students' Reasoning Ability

	Susi Delfia	Universitas Negeri Padang	Preliminary Research of Model Eliciting Activities (MEAS) Learning Based to Improve Junior High School Learners' Mathematical Critical Thinking Ability
	Nurul Afifah Rusyda	Universitas Negeri Padang	Analysis of Students` Mathematical Communication Skill in Calculus Course
	Ronal Rifandi	Universitas Negeri Padang	Teachers' Perception on Science, Technology, Engineering, and Mathematics (STEM) Education

Development of Mathematical Learning Devices Based on Realistic Mathematics Education (RME) in Nursing Vocational School of Nursing Vocational School, Smeseter I

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Abstract

This study discusses the development of mathematics learning tools based on realistic mathematics education for nursing skills programs in class X SMK. The development of learning devices is carried out by linking subjects to nursing skills programs with mathematical material through curriculum analysis. In addition, other supporting data were obtained through student analysis, needs analysis, and concept analysis. The results of some of these analyzes will serve as the basis for designing mathematical learning devices based on realistic mathematics education.

Keywords: learning devices, realistic mathematics education

Descriptive Student Difficulties in Analytic Geometry in Circles and Sphere Material

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Abstract

This study aims to identify students' difficulties in solving analytical geometry problems in circular and spherical material. Analytical geometry is one of the main subjects. The subject of this research is the 2nd semester students of the Mathematics Department at Padang State University. The type of this research is descriptive research. The type in this study is a qualitative approach. The data collection technique in this study is the method of documentation, tests and interviews. Data analysis was carried out in a qualitative descriptive. The results showed that the learning difficulties of students in the circle and sphere materials in terms of concepts, principles, and algorithms were: (a) the difficulties of students in remembering the circumference and breadth of the circle and sphere (c) difficulties in classification (d) students' skills in basic errors (e) calculation errors (f) students have not been able to master the algorithm. Teachers' efforts to overcome student learning difficulties, namely: (a) provide training in varied questions (b) make a personal approach to students (c) repeat the questions that have been learned (d) provide direction to students to remember the formula learned (e) guiding and directing students to use the algorithm correctly. So that the teacher needs to use the right strategies and methods in teaching mathematical concepts.

Development of Mathematical Learning Tool Based on Realistic Mathematics Education (RME) Approach to Art Expertise Class X Semester I Vocational School

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Abstract

The mathematics learning tool developed was based on a realistic mathematics education approach for art class X vocational skills programs.The developing of learning tool was done by connecting productive subjects of art expertise programs with mathematical material that is learned through curriculum analysis. In addition, other supporting data were obtained through student analysis, needs analysis, and concept analysis. The results of some of these analyzes will serve as the basis for designing mathematical learning devices based on realistic mathematics education.

Keyword: Learning tool, realistic mathematics education

The Developed Hypothetical Learning Trajectory For Integral Topic Which Based On Realistic Mathematics Education In The Phase of One to One Evaluation

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Abstract

This article discussed the development of Hypothetical Learning Trajectory For Integral Topic Which Based On Realistic Mathematics Education. The study focused on the phase of one to one evaluation by using observation. In this phase, we try it out to three students which divided into low, medium and high mathematics ability. Based on the observation, it can be concluded that the designed HLT can guide the student to achieve the expected purpose, that the student can construct and discover the concept of integral by themselves based on their experience. Student use their reasoning ability to solve the given real problem so that their mathematical reasoning ability is improved.

Keyword: Hypothetical Learning Trajectory, Integral, One to One Evaluation, Realistic Mathematics Education.

(PRELIMINARY RESEARCH)DEVELOPMENT OF HIGH SCHOOL MATH LEARNING DEVICES BASED ON PROBLEM BASED LEARNING

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Abstract

The students' problem solving mathematics ability have been optimal yet. This is related to mathematics learning that involves less students with challenging problems in the learning process given by the teacher. The purpose of this study was to conduct a preliminary analysis of problem solving abilities in order to develop mathematical learning tools based on Problem Based Learning. Kind of this research is development research. Development model that is used is model plomp it has three phase, first is preliminary research, second is development or prototyping phase, and assesment phase. The result of data analysis in preliminary research show if : 1) The teacher has not been able to develop a learning tool that is able to guide students to discover mathematical concepts. 2) The inability of students to solve problems in the form of story problems. 3) Students are less able to solve questions that are different from the sample questions given. 4) Students need learning tools such as LKPD to guide students to find the concept of learning material. 5) The problems that students want in LKPD are problems that are related to real context problems that relate to the daily lives of students.

Keywords : Problem Based Learning, Problem Solving Skill, Model Plomp.

Development of Understanding Ability of Student's Mathematical Concept Using the STAD Cooperative Learning Models Through Student's Worksheet

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Abstract

The purpose of sequential mathematics learning begins from understanding mathematical concepts to a higher level. Understanding mathematical concepts is the initial foundation for students to be able to achieve other mathematical goals. This shows the ability of mathematical understanding that provides abilities needed by students in mathematical learning. One of mathematical learning models that can help students to understand mathematical concepts is STAD. The STAD is a cooperative learning models which is able to improve student's understanding of mathematical concept by it stages of lesson itself. To study and describe the development of understanding of student's mathematical concepts using STAD learning models though worksheets, we conduct research in class VIII 3 of SMP Negeri 18 Padang. We also do 6 quizzes and it support this research that implementation of STAD learning models increase student's understanding to mathematical concept.

Keywords: understanding concept, cooperative learning models

ANALYSIS OF THE ABILITY MISCONCEPTION INPARTICIPANTS OF CLASS SEVEN

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Abstract

The purpose of this study was to analyze misconceptions that occur of students in class seven. The form of this study is a descriptive qualitative research approach that accurately describes a group. The research subjects in this study were students class seven. From the research conducted, it was found that there were misconceptions in students class seven.

Advantages and Challenges of the Flipped Classroom Application – Based Learning in Enhancing 10th Grade Senior High School Students' Reasoning Ability

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Abstract

Mathematical reasoning ability need to be trained during mathematics learning process at school. Based on the field observations at school, it was found that students' mathematical reasoning abilities were still low. This was due to the hours limitation during teaching and learning process in the classroom, so learning process only focused on explaining the materials without much discussing the exercises that required reasoning abilitiy in its accomplishment. The Flipped Classroom – Based Learning Model could be an alternative to overcome this problem, because the students could learn at home by using online and offline videos. Thus, the students could prepare themselves first before discussing the reasoning exercises in the classroom. The purpose of this study is to review the advantages and challenges in applying a learning model based on Flipped Classroom. This research is a development research. The method used is a quantitative method to observe improvement in student learning outcomes and qualitative method to review the advantages and challenges of the Flipped Classroom model. The instruments in this study were final tests of mathematical reasoning abilities, questionnaires, interview guidelines, and observation sheets. Research revealed that the advantages obtained: 1) Increased learning outcomes of students; 2) Time efficiency; 3) Student involvement and satisfaction; 4) Increasing student interaction; 5) Overcoming the problem of students 'self-confidence, while the challenges in this model are 1) Lack of students' preparation; 2) Familiarize the model; 3) Limitations of self-help learning; 4) Need a lot of time and work; 5) Access to technology.

Keyword: Advantages and Challenges, Flipped Classroom, Flipped Classroom Aplication, Students' Reasoning Ability

PRELIMINARY RESEARCH OF MODEL ELICITING ACTIVITIES (MEAs) LEARNING BASED TO IMPROVE JUNIOR HIGH SCHOOL LEARNERS' MATHEMATICAL CRITICAL THINKING ABILITY

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Abstract

Mathematical critical thinking ability of junior high school learners in Indonesia is still low (≤50%). The root is the learners' difficulty in accomplishing mathematical predicament, primarily the factual mathematical problem. This study intends to examine learning prerequisite of the Model Eliciting Activities (MEAs) based to improve junior high school learners' mathematical critical thinking ability. The study is completed in descriptive method. The data are collected through questionnaires, interviews, documentation, and test of critical thinking ability. The subjects of the study are the learners' of SMPN 8 Padang Grade VIII and the math teacher. The research findings confirm that: (1) the learner's critical thinking ability is still low, (2) the learners' encounter intricacy in constructing mathematical model from the problem given, and (3) unavailability of proper tools with learners' characteristic to help them exercising critical thinking. Derived from the result of this preliminary research, the math teacher and the learners of SMPN 8 Padang require learning device that can increase the learners' mathematical critical thinking ability. To conclude this first round study, it is necessary to develop the learners' worksheet (LKPD) using the approach of Model Eliciting Activities (MEAs) based in math learning.

Keywords: Model Eliciting Activities, critical thinking ability, learners' worksheet (LKPD)

Analysis of Students` Mathematical Communication Skill in Calculus Course

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Abstract

The purpose of this research is to analyze students` mathematical communication skill by using essay test. This research was conducted by using quantitative approach with descriptive method. The result showed that 1) 51,4% students can express mathematical ideas in oral/written form into images, graphics, or algebraic expressions; 2) 34,3% students can state mathematics problem in daily experience into a mathematic symbol/mathematic model; and 3) 45,7% students can interpret images/diagrams into mathematical ideas. The mathematical communication skills of students in calculus is still low and need to be improved for further research.

Keywords: List four to six keywords which characterize the article.

Teachers' Perception on Science, Technology, Engineering, and Mathematics (STEM) Education

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Abstract

STEM education have become a trending topic to be discussed among educational experts. However, there is still limited data about teachers perception about it. Therefore, the aim of this study is to describe teachers' perception about Science, Technology, Engineering and Mathematics (STEM) Education. This study is a descriptive research using survey method. The data were collected through questionnaire. The collected data was analyzed by using percentage technique.

Keywords: STEM Education, Teachers' Perception.

Room 6 **Moderator : Dr. Yulyanti Harisman, S.Si.,M.Pd**

Location : 3rd Floor FMIPA Terpadu Buiding, Seminar Room

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Ainil Huda	Universitas Negeri Padang	Development of Learning Devices with Realistic Mathematics Education (RME) Based in the Mechanical Engineering and Automotive Engineering Program for Vocational School Students
	Depi Elpina	Universitas Negeri Padang	Pengembangan Perangkat Pembelajaran Berbasis *Realistic Mathematics Education* (RME) Untuk Meningkatkan Kemampuan Koneksi Matematis Peserta Didik Kelas IX SMP
	Lili Rismaini	Universitas Putra Indonesia	Implementation of Modul Based on Snowball Throwing Model to Improve Interest of Exercise Working in Mathematical Learning for 4th Grade in SDN 19 Nan Sabaris
14.30 – 15.15	Lily Andriani	Universitas Negeri Padang	Validity of Statistics Material Learning Design Based on Realistic Mathematics Education to Improve Mathematical Communication Skills
	M. Febri Ramadhan	Universitas Negeri Padang	The Development of Student Worksheets Based on Structured Problem Posing Approach to Improve Mathematical Concept Understanding
	Mirna	Universitas Negeri Padang	Students' Caracteristics, Learning Outcomes, and Needs of Geometry Media Tools in Junior High School of Padang
15.15 – 16.00	Najma Dewara Putri	Universitas Negeri Padang	The Initial Ability Of Mathematical Communication Of Students With The Realistic Mathematics Education (RME) Approach Class VIII Junior High School

	Ramadoni	National Dong Hwa University	Educational Innovations: Mathematics Learning is based Online by Flipped Classroom Method
	Rian Putra H	Universitas Negeri Padang	Developing of Mathematic Learning Device Based Descovery Learning Method in Increasing the Students' Problem Solving Abilities at Seventh Grade
16.00 – 16.30	Syafriandi	Universitas Negeri Padang	Designing Hyphotetical Learning Trajectory for Learning the Concept of the Importance of Hypothesis Testing
	Muhammad Subhan	Universitas Negeri Padang	Professionalism of Teacher in Geogebra Software

Development of Learning Devices with Realistic Mathematics Education (RME)-Based IN the Mechanical Engineering and Automotive Engineering Program for Vocational School Students

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Abstract

The aim of this research is to develop the learning devices with RME-Based in the mechanical engineering and automotive engineering program for the students in grade X. The devices designed are adjusted to the students' program. The mechanical engineering students learn about designing, constructing, and operating the machine. While the automotive engineering students learn about designing and constructing the car. The learning devices designed are Lesson Plan and Students Worksheet . This research uses Plomp Model. This research is just done to the preliminary research step. The result shows the devices made by the teacher was universal without considering the characters of the students in each program.

Keywords: Mathematics Learning Devices, RME approach, mechanical engineering and automotive engineering program, Model Plomp, Preliminary research.

PENGEMBANGAN PERANGKAT PEMBELAJARAN BERBASIS REALISTIC MATHEMATICS EDUCATION (RME) UNTUK MENINGKATKAN KEMAMPUAN KONEKSI MATEMATIS PESERTA DIDIK KELAS IX SMP

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Abstract

Mathematics is not given to students in its final form, but students must be able to contract their own knowledge through contextual problems interactively, either formally or informally so that students discover for themselves the truth of the concept. One important component in mathematics learning is mathematical connections, but in reality students' mathematical connection skills are not good. Therefore, it is necessary to develop learning tools based on Realistic Mathematics Education (RME) in the form of RPP and LKPD. Learning tools designed using the RME approach by adding strategies relating, experiencing, applying, cooperating, and transferring (REACT) are based on constructivism so that students are the center of learning itself. The purpose of this study was to develop a valid, practical and effective learning device based on Realistic Mathematics Education (RME) to improve the connection skills of Grade IX students in junior high school. This research is a development research that uses the Plomp model which consists of 3 phases namely the preliminary phase, the development phase, and the assessment phase.

Keyword: RME approachand mathematic connection ability

IMPLEMENTATION OF MODUL BASED ON SNOWBALL THROWING MODEL TO IMPROVE INTEREST OF EXERCISE WORKING IN MATHEMATICAL LEARNING FOR 4th Grade IN SDN 19 NAN SABARIS

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Abstract

This research is motivated by the low interest of students in the training in mathematics learning in the fourth grade of SDN 19 Nan Sabaris, Padang Pariaman Regency. The purpose of this study was to look at the contribution of snowball throwing-based teaching materials to increase the interest in working on mathematics training for fourth grade students of SDN 19 Nan Sabaris. This type of research is descriptive, with a sample of all fourth grade students of SDN 19 Nan Sabaris registered in the 2018/2019 school year. The sampling technique used was purposive sampling because the available sample classes were limited. The instrument used was the observation sheet, and the results of the instrument analysis showed an increase in students' interest in doing mathematics training after the use of Snowball Throwing-based teaching materials in grade IV SDN 19 Nan Sabaris.

Keywords: Teaching Materials, Snowball Throwing, Interests, Exercise Training.

VALIDITY OF STATISTICS MATERIAL LEARNING DESIGN BASED ON REALISTIC MATHEMATICS EDUCATION TO IMPROVE MATHEMATICAL COMMUNICATION SKILLS

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Abstract

The purpose of this study is to produce learning designs that can help students understand statistical concepts by using the Realistic Mathematisc Education (RME) approach to improve mathematical communication skills implemented in the HLT (Hypothetical Learning Trajectory), valid teacher books and student books. The method used is a combination of the Plomp research design model and the Gravemeijer and Cobb model, which consists of 3 phases namely the preliminary research phase (preliminary research / preparing for the experiment), the development phase (development or prototyping phase / design experiment) and the assessment phase (phase assessment / retrospective analysis). The research subjects were eighth grade students of junior high school. The instruments used were HLT validation sheets, teacher book validation sheets, and student book validation sheets which contained aspects of content, language, presentation and graphics or appearance. The results of expert validation of HLT validation sheets, teacher books and student books show that learning design meets valid criteria.

Keywords: Learning design, Realistic Mathematics Education, Hypothetical Learning Trajectory, Statistics.

The Development of Student Worksheets Based on Structured Problem Posing Approach to Improve Mathematical Concept Understanding

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Abstract

Structured problem posing called by "how-if strategy", because student try to modify information given of problem and solve it. Structured problem posing approach also can be implementated in student worksheets. The result of this study indicate that worksheet developed was valid and practical. Based on student's mathematical concept understanding test after using the worksheet, mathematical concept understanding improved with a mastery level 86% and that included high category. So structured problem posing approach is strongly recommended on student worksheets.

Keywords: Structured problem posing, mathematical concept understanding.

Students' Characteristic, Learning Outcomes and Needs of Geometry Media Tools in Junior High School at Padang

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Abstract

This research describes students' characteristics, learning outcomes and geometry media tools that is used in Junior High School at Padang. Students' attitude, interest and motivation to learn was in good category. But, that could not be basic to get high students' learning outcomes. Students' problem was not only at high order thinking level but also in understanding geometry concepts. That was because paper and pen learning which happened in classroom at mathematics learning and that was not meaningful learning to students. So, geometry learning needs to be facilitated by using media learning with scientific approach.

Keywords: geometry, learning outcomes, media tools, students' characteristic.

The Initial Ability Of Mathematical Communication Of Students With The Realistic Mathematics Education (RME) Approach Class VIII Junior High School

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Abstract

This study aims to determine the initial abilities of mathematical communication of students, namely by providing mathematical questions related to the daily lives of eighth grade students of junior high school. Questions are made based on indicators of communication skills. The instrument used was in the form of a preliminary test with 3 items and a sample of 35 people. Assessment is seen from the scoring rubric of mathematical communication skills. The results of the initial test of students were 37.77%. These results indicate the need for follow-up to improve it.

Keywords: Mathematical Communication, Initial Test, Realistic Mathematics Education (RME)

Educational Innovations: Mathematics Learning is based Online by Flipped Classroom Method

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Abstract

This study aims to innovate in mathematics based online learning at Taiwan Open University. This campus created by the Indonesian government aims to solve the problem of education in Indonesia. The number of Indonesian people who do not get the opportunity to study at a university. One factor is economic problems. So this university can help Indonesians to learn at the same time also work. One of the campuses is in Taiwan, because there are so many Indonesian workers in Taiwan. But this online-based learning system provided by the Indonesian government has not been able to run perfectly, especially in mathematics learning. There are still some obstacles that occur during the learning process. Based on previous research by (Ramadoni, 2018) about the investigation of student difficulties in mathematics learning, it was seen that students' difficulties in online-based mathematics learning were in terms of content, process and assignments. So innovation needs to be done in this learning, because learning is methamorphosis. The difference between students made teacher has to arrange new methods to develop this learning. Differences in student backgrounds require us to innovate. The innovation carried out in this learning is online based learning using the flipped classroom method. Usually flipped classroom learning uses two stages, namely face to face and learning outside the classroom. But in this study used in two stages as well, first online learning using skype application and learning before the class starts. Flipped classroom methods are designed to solve students' difficulties in learning mathematics online both in terms of content, process and assignments. The formulation of the problems raised in this study are: How is the process and results generated by the innovation of mathematics learning by using online learning by flipped classroom method?

Keywords: Innovations, Online Learning, Flipped Classroom, Mathematics

DEVELOPING OF MATHEMATIC LEARNING DEVICE BASED DESCOVERY LEARNING METHOD IN INCREASING THE STUDENTS' PROBLEM SOLVING ABILITIES AT SEVENTH GRADE

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Abstract

This research aimed to develop the learning device based guided discovery in developing problem solving abilities of students at seven grade. Developing the learning device includes lesson plan and students' worksheets. The kinds of this research was reasearch and development by using Plomp model that had three phases, they are preliminary research, development and evaluation. In the development or prototyping phase, researcer designed lesson plans and student worksheets based on guided iscovery learning method based on material social arithmetic and proportional, then conducted self evaluation. On assessment phase, conducted limited practicalities and effectiveness test. The datas of practicality obtained from observation sheets of RPP implementation, questionnaire for teachers, and questionnaires for students. The effectiveness datas obtained from students learning outcome on final test to determine students' problem solving ability.

Keywords: Guided Discovery, Problem Solving, Plomp Development Model

Designing Hyphotetical Learning Trajectory for Learning the Concept of the Importance of Hypothesis Testing

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Abstract

This study aims to design student learning trajectories in learning the concept of the importance of hypothesis testing in inferential statistics. This study used design research. Design research consists of three stages, i.e. (1) preparing for the experiment; (2) teaching experiment; and (3) retrospective analysis. This study focused on the first stage, because the main purpose of this research was to develop a series of learning activities to learn the importance of hypothesis testing in inferential statistics. The result of this study is an hyphotetical learning trajectory (HLT) to find the concept of the importance of hypothesis testing in inferential statistics. HLT was designed using a realistic mathematics education (RME) approach. The context used in designing HLT is to tossed a coin to determine which football team will kick off. Using iceberg, a series of learning trajectories are designed so that students are able to find out for themselves that testing hypotheses is an important concept in proving the assumption that coin is used in balance.

Keywords: Hyphotetical learning trajectory, hypothesis testing, tossed a coin

Professionalism of Teacher in Geogebra Software

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Abstract

Research on teacher professionalism in the learning process experiences exponential growth. One form of teacher professionalism is how teachers can use media that can make learning interesting. Geogebra is an application that can be used by teachers in learning on certain material. This research was a survey research that sees teacher interest in the use of geogebra software. Thirteen teachers from 10 junior high schools in one sub-district at Padang city were chosen as research subjects. The training was held for five hours. When the teacher training was videotaped, observed, and interviewed. The results of the documentation were analyzed and coded to classify the types of teacher interest in training. The types of teacher interest in the training would be explained detail in this study

Keywords: teacher profesionalism, geogebra, training.

Room 7 **Moderator : Khairani, M.Pd**

Location : 4th Floor IPA Terpadu Buiding, FMA01220 (Lab Computer 1)

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Belina Yance Putri	Universitas Negeri Padang	Effect of Realistics Mathematics Education (RME) Approach with TANDUR Design on Understanding Concepts and Solving Mathematical Problems of Grade VIII Students of SMP Negeri 1 Pantai Cermin
	Beri Santoso	Universitas Negeri Padang	Validity of Mathematic Learning Teaching Administration Based on Realistic Mathematics Education Approach to Improve Problemsolving
	Doni Kurniawan	Universitas Negeri Padang	Mathematics Learning Equipment Design based on Profession Competence on Audio Video Technique Skill Program in Vocational School
14.30 – 15.15	Fadillah Perdana Cahyani	Universitas Negeri Padang	Preliminary Research Development of Mathematics Learning Tools Based on Problem Based Instruction (PBI) To Improve Critical Thinking Ability of Grade X High School Students
	Lisa Laila Rafida	Universitas Negeri Padang	An Early Observation of Learning Devices Development Based on Discovery Learning to Increase Creativity of Senior High School Students
	Mawaddah Arrahmah	Universitas Negeri Padang	Early Student Troubleshooting Skills With RME Approaches In Class XI SMA
15.15 – 16.15	Mukhni	Universitas Negeri Padang	Teachers' Perspective of Media Tools in Mathematics Learning at Senior High Schools
	Nisa Fitriani	Universitas Negeri Padang	An Early Observation of Mathematics Learning Devices Development Based on Realistic

			Mathematics Education to Increase the Ability of Mathematical Problem Solving of Senior High School Students
	Siltisma Wiska	Universitas Negeri Padang	Practicality of Geometry Learning Devices Van Hiele Theory To Improve Mathematical Critical Thinking Ability On Junior High School Students Grade VIII
	Yarisda Ningsih		Pengaruh Implementasi *Teori Bruner* Terhadap Pemahaman Konsep Penjumlahan Pecahan Di Sekolah Dasar

Effect of Realistics Mathematics Education (RME) Approach with TANDUR Design on Understanding Concepts and Solving Mathematical Problems of Grade VIII Students of SMP Negeri 1 Pantai Cermin

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Abstract

The aims of this study was to look at the effect of using the Realistics Mathematics Education approach with the TANDUR design on students' ability to understand concepts and solve problems in Mathematics in SMP Negeri 1 Pantai Cermin both to the students who had high previous knowledge and those who had low previous knowledge. This was a quasi experimental research which was conducted in the Academic Year 2014 /2015. The population of this study was eighth grade students of SMP Negeri 1 Pantai Cermin. To choose the sample class, researchers tested the sample class. The data obtained were then analyzed quantitatively using t-test, Mann Whitney test and two Ways Anova using MINITAB software. The result of data analysis showed that : (1) problem solving ability of the student who were taught by using Realistic Mathematics Education approach with the TANDUR desain were better than those who were taught by using conventional one, (2) conceptual understanding and problem solving ability of the students who had high previous knowledge and were taught by using Realistics Mathematics Education approach with the TANDUR were better than those who also had high previous knowledge but were taught by using conventional one, (3) problem solving ability of the student who had low previous knowledge and were taught by using Realistics Mathematics Education approach with the TANDUR were better than those who also had low previous knowledge but were taught by using the conventional one, (4) there was no interaction between learning approaches and previous knowledge toward the eighth grade students; ability in understanding the concept and solving the problem in Math at SMP Negeri 1 Pantai Cermin.

Keywords: RME, problem solvong TANDUR desain

VALIDITY OF MATHEMATIC LEARNING TEACHING ADMINISTRATION BASED ON REALISTIC MATHEMATICS EDUCATION APPROACH TO IMPROVE PROBLEMSOLVING

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Abstract

The purpose of this study was to produce a device based on RME approach that was validtoward problem solving abilities of students in class seven. Developedlearning device was Learning Implementation Plans and Student Worksheets. This research was a development research with a Plomp model which consists of three stages namely preliminary research, development stage, and assessment stage. At the development stage, the design and assessment of learning devices was carried out through the formative evaluation stages.

Keywords: RME, ProblemSolving, Plomp Development Model

Mathematics Learning Equipment Design based on Profession Competence on Audio Video Technique Skill Program in Vocational School

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Abstract

Vocational students are prepared to work and have expertise in the vocational field, therefore learning in vocational schools should pay attention to the professional competencies of the students themselves. Learning mathematics in vocational schools in learning mathematics does not relate the relationship of mathematics to the subject matter so that made students bored in learning mathematics and think mathematics is a difficult, unattractive and less useful lesson. Learners prefer productive subjects according to their professional competence. This will affect the purpose of learning mathematics in Vocational Schools in improving students' mathematical problem solving skills. The development of professional competency-based learning tools is expected to overcome the problem of increasing problem-solving skills of vocational students in the audio video engineering program. This study aims to develop learning tools in the form of Learning Implementation Plans (RPP) and Student Worksheets (LKPD) using the Plomp model which consists of three stages: preliminary research, stage prototype, and assessment phase. This article is a preliminary research phase, which is needs analysis, curriculum analysis, concept analysis, analysis of students and teachers of vocational mathematics. Audio video techniques. The results in the Preliminary Research stage become a reference in designing products in the form of mathematics-based professional learning devices in the audio video engineering expertise program.

Keywords: Learning Tools, Professional Competency-Based Mathematics, Audio Video Techniques

Preliminary Research Development of Mathematics Learning Tools Based on Problem Based Instruction (PBI) To Improve Critical Thinking Ability of Grade X High School Students

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Abstract

This study discusses the development of problem-based mathematics instruction-based learning tools (PBI) to improve thinking skills of class X students. The learning tools developed consist of Learning Implementation Plans (RPP) and Student Worksheets (LKPD). The development models used in this study are the Plomp model (Preliminary Research, Prototype Phase, and Assessment Phase). However, this study only reached preliminary research. The subject of this study was grade X students of SMAN 15 Padang. Based on the results of interviews conducted on several teachers of SMAN 15 Padang, they can discuss mathematics learning tools commonly used by public teachers, but have not facilitated students' thinking skills in learning.

Keywords: Mathematics Learning Tools, Problem Based Instruction, Preliminary Research

An Early Observation Of Learning Devices Development Based On Discovery Learningto Increase Creativity Of Senior High School Students

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Abstract:

Creativity is a combination of logical and divergent thinking that is used to bring up a new idea. An early observation of learning devices development based on discovery learning aims to (1) to know an initial conditions of mathematical planning and learning that developed by the teacher (2) to know and review how creativity of senior high school students in mathematics learning (3) whether it is necessary to continue research development based on discovery learning to improve creativity of senior high school students. The results of preliminary observations indicate that: mathematics planning and learning that developed by teachers is still general. So that the creativity of high school students in mathematics learning is still low. Based on this, follow-up is needed in the form of research on development based on discovery learning to increase creativity of senior high school students (SMA N 5 Padang on 2018/ 2019).

Keywords: Learning Device, Discovery Learning, Creativity

Early Student Troubleshooting Skills With RME Approaches In Class XI SMA

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Abstract

Students' problem solving skill in learning math has not been fully trained yet. It was caused by the learning process only focus on memorizing formula by doing exercises and test at the end of the learning process. This research aims to determine the initial ability to solve students classes in XI SMA class, namely by providing math problems related to the daily life of learners. Problems are based on the indicator of problem solving capabilities. The instrument used was an initial test with a question of 4 grains and a sample of 61 research persons. Assessment judging by the scoring section of the troubleshooting capabilities. The results of early student test studies amounted to 32.77%. These results indicate a need for follow-up to improve learners problem-solving skills.

Keywords: problem solving skill, early proficiency, realistic mathematics education

Teachers' Perspective of Media Tools in Mathematics Learning at Senior High Schools

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Abstract

Media tools are always been believed can increase students' learning outcomes. This study is to describe mathematics teachers' perspective of media tools in mathematics learning. Instrument is a questionnaire about media tools in Likert scale. Questionnaire was delivered to 35 mathematics teachers in Padang Pariaman. The result shows that mathematics teachers have good perspective of media tools in senior high school mathematics learning but the frequency of using it is still low.

Keywords: geometry, learning outcomes, media tools, students' characteristic.

An Early Observation of Mathematics Learning Devices Development Based on Realistic Mathematics Education to Increase the Ability of Mathematical Problem Solvingof Senior High School Students

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Abstract

Realistic Mathematics Education has a positive impact on the development of student learning. An early observation of mathematics learning devices development based on realistic mathematics education aims to (1)know, riview and discribe the conditions of mathematical planning and learning that developed by the teacher (2) know, riview and discribe the ability of problem solving of the senior high school students in mathematics learning (3) whether it is need to conduct research development of mathematics learning devices based on realistic mathematics education to increase the ability of mathematical problem solving. The result of observation and interviews with mathematics teachers at SMAN 14 Padang and SMAN 15 Padang, it can be concluded that the mathematics learning devices used by teachers are general. Based on this, it is important to conduct research of learning devices development based on realistic mathematics education to increase the ability of mathematical problem solving of senior high school students.

Keywords: Mathematics Learning Device, Realistic Mathematics Education, Ability of Mathematical Problem Solving.

Practicality of Geometry Learning Devices Van Hiele Theory To Improve Mathematical Critical Thinking Ability On Junior High School Students Grade VIII

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Abstract

This article discussed about the development of geometry learning device related to the ability of student's mathematical critical thinking. It is based on the low ability of student on geometry. Student could be said having critical thinking if they could give a reason to solve mathematical problems with including any of consideration to make decisions. The fact in the field shows student have dependency on teacher in accepting information, inadequate media in geometry learning makes students are not cultivated in solving mathematical problems with critical thinking. It makes students have difficulties in understanding geometry, the lack of understanding in geometry object has an impact on students critical thinking ability. This research is aimed to develop student mathematical critical thinking. This research use Plomp model which have three stages : initial investigation stage, Prototype development stage and reserach stag.e Subject on this research are teacher and students grade VII on SMPN 13 Padang. Based on the observation result on small group, Showed students are active and could solve problem critically with a better result each meeting. The result of teacher and students' interview showed positive response, and based on the analysis of questionaire showed pratical category. Inclusion, Learning device Van hiele theory based is practical for developing students'grade VIII ability in mathematics critical thinking.

Keywords: Practicality, Geometry Learning, Van Hiele Theory, Matematical Critical Thinking

The Effect of Bruner Theory Implementation to Comprehension of Fraction Addition Concepts in Elementary School

Yarisda Ningsih, Syafri Ahmad

Abstract

The purpose of this study is to determine the effect of the application of Bruner Theory to the understanding of the concept of the addition of unrelated pieces are not the same in class V SD. This type of research is Quasi Experimental Design with the design form of Nonequivalent Control Group Design. The population in this study were all students in grade V SDN 09 Bandar Buat Kota Padang with VA class sample as control class and VB class as experimental class. The results showed that there is an influence of the application of bruner learning theory to understanding the concept of the addition of unrelated denominations in class V SDN 09 Bandar Buat Kota Padang. Based on the calculation obtained t count> t table is 2.51> 2.01063 then Ho is rejected and H1 accepted.

Keywords: addition of fractions, bruner theory, understanding of concepts

Room 8 **Moderator : Trysa Gustia Manda, M.Pd**

Location : 4th Floor FMIPA Terpadu Buiding, FMA01223, Lab 2 Computer

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Andison	Universitas Negeri Padang	Development of Mathematical Learning Devices Based on Realistic Mathematics Education (RME) in Chemical Engineering Expertise Programs in Students in Class XI Vocational School
	Cici Afrilia	Universitas Negeri Padang	Development of Mathematics Learning Device Principle Guided Discovery Pisa Model Orientation (Preliminary Research)
	Fitrani Dwina	Universitas Negeri Padang	Hand's on Activity to Increase Student's Understanding about Place Value at Elementary School
14.30 – 15.15	Rafki Nasuha Ismail	Universitas Negeri Padang	Effectivity of Use Student Worksheets Based on Realistic Mathematic Educations Against Communication Mathematical Ability at Junior H School
	Suci Nadia Ramadhani	Universitas Negeri Padang	Preliminary Analysis on Development of Mathematics Learning Tool Based on Indicators of Mathematical Communication Skills
	Sutiaharni	Universitas Negeri Padang	Development of Mathematics Learning Devices Based on Realistic Mathematics Education At the Vocational High School of Accounting Finance Expertise Program (Preliminary Research)
15.15 – 16.15	Veggi Yokri	Universitas Negeri Padang	The Development of Mathematics Learning Tools Based on Inquiry Method That is Oriented to Students' Problem Solving Skillin SMK Grade X
	Wendri Doli	Universitas Negeri Padang	Development of RME-Based Mathematics Learning Tools to Increase Interest in Learning Mathematics Learners of Vocational School Offic Management Skills Program
	Yarman	Universitas Negeri Padang	Analysis of Student Error in Finding Solutions for Ordinary Different Equations Based on SOLO Taxonomy

	Yuli Dwi Andila	Universitas Negeri Padang	Practicality of Geometry Learning Sets Based on Van Hiele Theory to Increase Students Mathematical Communication Ability in Class VII Junior High School

Development of Mathematical Learning Devices Based on Realistic Mathematics Education (RME) in Chemical Engineering Expertise Programs in Students in Class XI Vocational School

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Abstract

This study aims to describe the development process and produce learning device development products based on Realistic Mathematics Education (RME) in the Chemical Engineering expertise program in Students in Class XI Vocational Schools that support valid, practical and effective problem-solving skills. This research is development research. The method used in the research is the method of developing Plomp with stages: (1) preliminary research (initial research), (2) prototyping phase (development stage), and (3) assessment phase (assessment phase). The product developed in this study is a learning device. Learning tools developed include: (1) Learning Implementation Plans (RPP) and (2) Student Worksheets (LKPD). The steps taken to produce learning devices in this study are: (1) analyzing the needs, (2) the draft development process, (3) drafting the development, (4) expert reviews and trials carried out in several stages namely (a) expert review and learning media experts, (b) analysis and revision I, (c) expert review of learning design, (d) analysis and revision II, (e) individual trials and small group trials, (f) analysis and revision III, (g) field trials: class and teacher, (h) analysis and revision IV, and (i) end product development results.

Keywords: Mathematic Realistic Education, Chemical Engineering, Mathematical Problem Solving Ability

DEVELOPMENT OF MATHEMATICS LEARNING DEVICE PRINCIPLE GUIDED DISCOVERY PISA MODEL ORIENTATION (PRELIMINARY RESEARCH)

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Abstract

The students' problem solving mathematics ability have been optimal yet. This case relate with learning that happen in the school has accustomed the students yet to finish questions of problem solving such as PISA. The goal of this research is to produce mathematics learning device base guided discovery PISA model orientation to improve the students' problem solving ability. Kind of this research is development research. Development model that is used is model plomp it has three phase, first is preliminary research, second is development or prototyping phase, and assesment phase. The result of data analysis in preliminary research show if : 1) The teacher has not been able to develop learning device to improve the students' mathematics ability. 2) Many students have opinon, if mathematics learning is sodifficult, the students can not comprehend the material well . 3) Learning sources that is used by the students has been maximal yet to get the students' interest in learning. 4) The students' need Learning device like as LKPD to comprehend matery of learning. 5) The students want interesting LKPD and the questions that is used not too mach. 6) The problem that is wanted by the students relate with employing mathematics knowledge in society life and the problem that relate with the students personal activity and the problem that there in their environment.

Keywords: Guided Discovery, PISA, Problem Solving Skills, Model Plomp.

Hand's on Activity to Increase Student's Understanding about Place Value at Elementary School

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Abstract

The purpose of this research was to increase student's understanding about place value at elementary school. This research was conducted at second grade of an elementary public school no 13 in Kecamatan Padang Barat. There were three phases of the development: preliminary research, development/prototype phase, and assessment phase. The model of development was adapted from Plomp model. This research was focused until development/prototyping and implementation. The fisrt step was discuss with teacher to get some information about the problems in mathematics instruction at the second grade. The teacher problem still have the difficulty how to show the real process in addition and subtraction operation at natural number. The second step was preparing the Base Ten Blocks and creating the booklet about how to use it . In this prototyping phase the booklet was corrected by teacher and expert. This phase had micro-cycle until the teacher and the students find the booklet useful. In first prototype, validation was conducted by self evaluation and expert review. After the revision of the first prototype, the second prototype was created, and then it was used to know about its practicality by implementation in small group evaluation and student in class..

Keywords: base ten blocks, booklet , elementary school

EFFECTIVITY OF USE STUDENT WORKSHEETS BASED ON REALISTIC MATHEMATICS EDUCATIONS AGAINST COMMUNICATION MATHEMATICAL ABILITY AT JUNIOR HIGH SCHOOL

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Abstract

This study aims to examine the effectiveness of student worksheets (LKPD) based on realistic mathematics educations (RME) for class VIII SMP. This research used to development reseach by Ploomp and design used quasi-experiments with Only-Postest Control Group Design. The research was conducted at SMP 7 Padang . The sample is determined by purposive sampling. The treatment in the experimental group was learning using RME-based LKPD while the control group used student books according to the 2013 curriculum. The instruments used were test items, learning observation sheets, and learning devices that had been tested for validity and practicality at the stage of development research. Data analysis was carried out by the t-test for the mean difference test and the Scheffe test for the effectiveness of the LKPD test. The results showed that the mathematical communication skills of SMP VIII students using RME-based LKPDs were better than junior high school students using student books, and RME-based LKPDs were effective for improving students' mathematical abilities.

Keywords: Learning Device, Worksheet (LKPD, Realistic Mathematics Educations Approach

Preliminary Analysis on Development of Mathematics Learning Tools Based on Indicators of Mathematical Communication Skills

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Abstract

It was aimed to describe data of preliminary analysis on development of mathematics learning tools based on indicators of mathematical communication skills. This research is a qualitative research because the main data about the result of a test of mathematical communication skills. The result of research indicate that the student's mathematical communication skills based on indicators were still weak and in the mathematics learning tools will be developed contains learning that will help students to improve mathematical communication skills.

Keywords: Preliminary Analysis, Development, Mathematics Learning Tools, Mathematical Communication Skills.

Development of Mathematics Learning Devices Based on Realistic Mathematics Education At the Vocational High School of Accounting and Finance Expertise Program (Preliminary Research)

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Abstract

Accounting and Finance is one of the expertise programs in Vocational High School. Graduates of this expertise program should have problem solving skills in order to be able to compete in the world of work. Mathematics is a subject that can develop mathematical problem solving skills. This study discusses the development of mathematical learning devices based on Realistic Mathematics Education in accounting and finance expertise programs in class X Vocational High School. The development model used is the Plomp model. However, this study only reached preliminary research. Based on the results of interviews conducted with mathematics teachers at SMKN 2 Padang and SMKN 3 Padang, it can be concluded that the Mathematics learning devices commonly used by teachers are general without giving differences in the characteristics of each existing expertise program, specifically in accounting and finance programs. And then students' mathematical problem solving abilities are still low.

Keywords: Mathematics Learning Devices, Realistic Mathematics Education , Preliminary Research

The Development of Mathematics Learning Tools Based on Inquiry Method That is Oriented to Students' Problem Solving Skill in SMK Grade X

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Abstract

Mathematics learning tools that are developed in this study are in the form of the lesson plan (RPP) and worksheet (LKPD). The development through the three stages of Plomp model. The results of this study show that the mathematics learning tools based on the inquiry method are valid, practical and effective in terms of feasibility and validity. In other words, this mathematics learning tools can be used as a reference to develop mathematics problem-solving skills for grade X in SMK.

Keywords: Inquiry, RPP, LKPD, Mathematical Problem Solving.

Development of RME-Based Mathematics Learning Tools to Increase Interest in Learning Mathematics Learners of Vocational School Office Management Skills Program

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Abstract

Abstrak: Based on the observations at SMKN Rambah Rohul Riau Regency especially in expertise Management Office program, we known that the students have low interest and motivation to learn mathematics. For solved this problems, we need to develop RME-based mathematics for incresing students' interest and motivatio in learning mathematics. Development products consist of RPP and LKPD based on RME with the development model of Plomp. Products are designed after Preliminary research on the curriculum, students, concepts and needs. After the product is designed tested through several stages, namely: (1) self-evaluation, (2) One-to-one, (3) Small group, (4) Field test.

Keyword : Development of the Plomp model, mathematics learning device, RME

Analysis of Student Error in Finding Solutions for Ordinary Differential Equations Based on SOLO Taxonomy

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Abstract

This study aims to describe student errors in solving ordinary differential equation (ODE) problems based on SOLO taxonomy. There are 6 kinds of errors, namely conceptual, using data, language interpretation, technical, and making conclusions. This descriptive study involved ten ODE class research subjects. The results obtained by research subjects tended to make mistakes in the six SOLO taxonomic errors. The reason is that students are not skilled in using formulas, not thorough, and habits do not repeat lessons

Keywords - Error Analysis, ordinary differential equation, and SOLO taxonomy

Practicality of Geometry Learning Sets Based on Van Hiele Theory to Increase Students Mathematical Communication Ability in Class VII Junior High School

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Abstract

In this study, geometry learning devices were developed based on the Van Hiele Theory with purpose is to produce a product consisting of lesson plan and students worksheet to develop students mathematical communication ability. The development model used is Model Plomp. Based on the results obtained in small group stage, there is increase in students mathematical communication ability seen from the result of working the questions every meeting. Then, an analysis the questionnaire of students who obtained practical category. So that, it can be concluded that geometry learning sets based on Van Hiele Theory practical can be used to Increase Students Mathematical Communication Ability in Class VII Junior High School.

Keywords. Practicality, Geometry Learning, Van Hiele Theory, Mathemathical Communication Ability.

Room 9 **Moderator : Maulani Meutia R, M.Pd**

Location : 4th Floor FMIPA Terpadu Buiding, FMA01222, Lecture Room

Time	Presenter	Institution	Paper Title
13.45 – 14.30	Asmanelita Faizasari	Universitas Negeri Padang	The Development of High School Mathematics Learning Devices Bas on Guided Discovery Models to Improve Mathematical Reasoning Abilities (Preliminary Research)
	Ikhsan Apria Suske	Universitas Negeri Padang	Preliminary Research Mathematics Principle M-APOS Theory to the Student of the Seventh Grade
	Neilur Rahmi	Universitas Negeri Padang	Preliminary Research Development of Problem-Based Learning Dev (PBL) With Scientific Approach to Increase Mathematical Solving Ability for Students In Class VIII MTS
14.30 – 15.15	Noperta	Universitas Negeri Padang	The Validity of Realistic Mathematics Education Base Teaching Materials for Grade X Students in Vacotional High School Majoring Construction and Property Engineering
	Ramzil Huda Zarista	Universitas Negeri Padang	Development of Mathematics Learning Devices Based Learning Cyc to Increase Mathematical Reasoning Ability for Students in Class VII SMP/ MTS
	Selvia Putria Tanjung	Universitas Negeri Padang	Development of Mathematical Learning Devices Based on Coaching Techniques for Students in Class VII SMP as an Efforts to Create Accelerated Learning Revolution of The XXI Century
15.15 – 16.15	Suherman	Universitas Negeri Padang	The Effectivity of AR-Geometry Interactive Book in Increasing Stude Mathematical Reasoning Skill
	Syelfia	Universitas Negeri Padang	Development of Learning Devices With Realistic Mathematics Educa (RME)-Based in the Pharmaceutical Program for Vocational School Students
	Wahyu Handayani	Universitas Negeri Padang	Improving Mathematical Problem Solving Ability of Students in Hospitality and Tourism Program Class X SMK Semester 1 by Using Realistic Mathematics Education (RME) Approach

	Winda Nur Mentari	Universitas Negeri Padang	Students Engagement in Mathematical Learning Based on Contextual Teaching and Learning Class VIII MTS Kabupaten Tanah Datar

THE DEVELOPMENT OF HIGH SCHOOL MATHEMATICS LEARNING DEVICES BASED ON GUIDED DISCOVERY MODELS TO IMPROVE MATHEMATICAL REASONING ABILITIES (PRELIMINARY RESEARCH)

Asmanelita Faizasari # 1, and Yerizon # 2

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Abstract - Students' mathematical reasoning abilities are not optimal, this is related to learning that occurs in schools that have not accustomed students to solving the mathematical reasoning questions given by the teacher. The purpose of this study was to produce a guided discovery-based mathematics learning tool to improve students' mathematical reasoning abilities. This type of research is development research. The development model used is the plomp model which consists of three phases, namely the initial investigation phase (preliminary research), the development phase or prototype making (development or prototyping phase), and the assessment phase. The results of data analysis in the preliminary research phase show that: 1) Teachers have not been able to develop their own learning devices to improve students' mathematical abilities. 2) There are still students who think that math lessons are difficult. 3) Development of LKPD is needed by students in understanding the subject matter. 4) Problems that students want to discuss in LKPD are problems related to the use of mathematical knowledge in daily life and problems related to the personal activities of students.

Keywords: Guided Discovery, reasoning ability, Model Plomp.

PRELIMINARY RESEARCH MATHEMATICS PRINCIPLE M-APOS THEORY TO THE STUDENT OF THE SEVENTH GRADE

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Abstract

Creative thinking of ability is habitual of thinking that be practiced by observe new probabilities.To make diffirent pant of view in generating opened idea. The student's ability creative thinking is still low it is caused because teacher is less to pay attention ability that owned by the student. The students have little ability to solve the problems by using another alternative. Purpose of this research is to produce learning equipment M-APOS theory to improve the students' creative thinking ability. M-APOS theory directs the students to search information about problem thet given to evoke the student's idea. The methods of the research is research and development theare three steps. The are first investigation, developmet step and assessment step. Instrument of this research is interview and questionnaire. The result of data analysis in preliminary research is: (1) tool and school's infrastructure is not complete yet. (2) the student's out come is still low it is caused the student seldom repeat the material that is given by the teacher in the house. (3) media of learning that is used bythe teacher has not gotten the student's attention to study yet. (4) the students like to study in group. (5) the student want to do the questions in LKPD it is kind of the question that the student often find in daily life.

*Keyword:*M-APOS Theory, Creative Thinking Mathematics Ability

Preliminary Research DEVELOPMENT OF PROBLEM-BASED LEARNING DEVICES (PBL) WITH SCIENTIFIC APPROACH TO INCREASE MATHEMATICAL SOLVING ABILITY FOR STUDENTS IN CLASS VIII MTs

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Abstract

This study discusses about the development of PBL-based mathematics learning devices with the Scientific Approach in class VIII of Islamic Junior High School to increase mathematical problem solving abilities in the form of Learning Implementation Plans and Student Worksheets. The development model used is the Plomp model. However, this research only arrived at the preliminary research stage. Data obtained by the average problem solving ability of students is still relatively low due to learning, devices that do not support students to increase their problem solving skills.

Keywords: Mathematics Learning Devices, PBL Model, Scientific Approach, Mathematical Problem Solving Ability, Preliminary Research.

THE VALIDITY OF REALISTIC MATHEMATICS EDUCATION BASE TEACHING MATERIALS FOR GRADE X STUDENTS IN VACOTIONAL HIGH SCHOOL MAJORING CONSTRUCTION AND PROPERTY ENGINEERING

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Abstract

This research is a part of RME-Based mathematic teaching material development research to improve mathematical communication skills of Grade X students in Vocational High Schools majoring construction and property engineering, and is aimed to assess validities teaching materials through two steps. First, self-evaluation was conducted by involving another peer student. Results show that Mathematics teaching materials are able to be proceeded to expert review phase with minor revision. Second, Expert review was conducted by the researcher asking for assessment from five experts. Results show that Mathematics teaching materials have been valid.

Keywords: Validitas, RME, mathematical communication

DEVELOPMENT OF MATHEMATICS LEARNING DEVICES BASED LEARNING CYCLE 5E TO INCREASE MATHEMATICAL REASONING ABILITY FOR STUDENTS IN CLASS VIII SMP/ MTs ".

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Abstract

The problem in this research is the students' mathematical reasoning ability is still low, the cause is that the learning device designed by the teacher has not supported the formation of these abilities. Through the development of this device, it is expected that students' abilities in mathematical reasoning can increase. Learning devices developed in the form of Lesson Plan (RPP) and Student's Worksheet (LKPD). The development model used in this research is the Plomp model (Preliminary Research, Prototyping Phase, and Assessment Phase). This study produces learning devices that meet valid, practical, and effective criteria.

Keywords: Mathematics Learning Devices, Learning Cycle 5E Model, Mathematical Reasoning Ability, Plomp Development Model.

DEVELOPMENT OF MATHEMATICAL LEARNING DEVICES BASED ON COACHING TECHNIQUES FOR STUDENTS IN CLASS VII SMP AS AN EFFORTS TO CREATE ACCELERATED LEARNING REVOLUTION OF THE XXI CENTURY

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Abstract

one of the efforts to create a rapid learning revolution of the XXI century, the need for innovation in mathematics learning is to develop learning tools based on Coaching Technique. Learning tools used in the form of RPP and LKPD are designed as substitutes for Coach for teachers and students, so that the goals and objectives of learning can be achieved. Coaching provides steps that are systematic, practical and directed from learning objectives. Coaching techniques can be implicated in the classroom by providing opportunities for teachers to improvise in teaching, making it easier for teachers to know the characteristics of their students and providing opportunities for students to develop their learning styles according to their respective abilities. The development model used is the plomp model, which consists of three phases. The first phase of the initial investigation, the second phase of the development or prototype creation, and the three phases of assessment.

The Effectivity of AR-Geometry Interactive Book in Increasing Students' Mathematical Reasoning Skill

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ABSTRACT

Mathematics is a subject that requires the students to gain reasoning abilities. Reasoning ability can be found when students learn geometry material. However, several studies concluded that geometry material is one of the difficult material for students. Difficulty of geometry is caused by the majority of mathematics teachers still use conventional media and teaching instruments in learning, especially in term of constructing the space. This is implemented on the AR-Geometry Interactive Book. This book is designed by using the principle of interactive 3D (three-dimensional) appearance by utilizing Augmented Reality (AR) based technology. This research uses a combination of qualitative and quantitative methods. The first qualitative data was taken by depth interviews to 4 informants selected with certain conditions using purposive sampling technique. The first phase of data collection aims to explore the information related to student interest in using the AR-Geometry Interactive Book. Furthermore, the second stage data was taken using a questionnaire to 21students in class VIII of SMPN 4 Ujung Batu. The second stage of data collection aims to support the results of the first phase of the research, all data in the second stage were then analyzed descriptively using quantitative analysis tools. Overall, the results of the second analysis indicate that the AR Geometry Book is appropriate to use in learning. To see students' mathematical reasoning abilities, tests were conducted by testing 3 essay questions. The results of the study prove that the use of AR-Geometry Interactive can improve students' mathematical reasoning abilities.

Keywords: AR-Geometry Interactive Book, Space, Reasoning Skills

DEVELOPMENT OF LEARNING DEVICES WITH REALISTIC MATHEMATICS EDUCATION (RME)-BASED IN THE PHARMACEUTICAL PROGRAM FOR VOCATIONAL SCHOOL STUDENTS.

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Abstract

The study aims to find out if devices developed consisiting LKPD and RPP based on RME can improve the ability to solve the mathematical problem of training 10 grade pharmaceutical skills programs. This study uses development research with the model used is Plomp . The data gained is the ability to solve mathematical problems of learners participants low because participants have little interest in mathematics. It is because learning tools do not supported participants to improve their problem solving capabilities.

Key Words : *Mathematical Learning Tools, Approach RME, Pharmaceuticals, Preliminary Research.*

IMPROVING MATHEMATICAL PROBLEM SOLVING ABILITY OF STUDENTS IN HOSPITALITY AND TOURISM PROGRAM CLASS X SMK SEMESTER 1 BY USING REALISTIC MATHEMATICS EDUCATION (RME) APPROACH

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Abstract

This research aims to make a mathematical learning plan that is suitable used to improve mathematical problem solving ability of students class X in hospitality and tourism program. The approach used in improving problem solving ability is the RME approach. There is also the method used in this research is literature study. After conducting a literature studies by quoting data from various sources, it's assumed that RME approach can improve the mathematical problem solving abilities of students class X SMK.

Keywords: RME, Problem Solving Ability, Hospitality and Tourism Program.

STUDENTS ENGAGEMENT IN MATHEMATICAL LEARNING BASED ON CONTEXTUAL TEACHING AND LEARNING CLASS VIII MTs KABUPATEN TANAH DATAR

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Abstract

The students engagement is important in the learning process. This study is useful to see whether there are differences in the students engagement between experimental classes that use learning tools based on contextual teaching and learning (CTL) with the control class. This research is a quasi-experimental study conducted at MTs N 3 Tanah Datar. Data were analyzed quantitatively by Wilcoxon signed rank test and descriptively. The results showed that sig (2-tailed) 0.005 <0.05 means that there were differences in the students engagement of experimental class with the control class.

Keywords: student engagement, contextual teaching and learning, learning devices