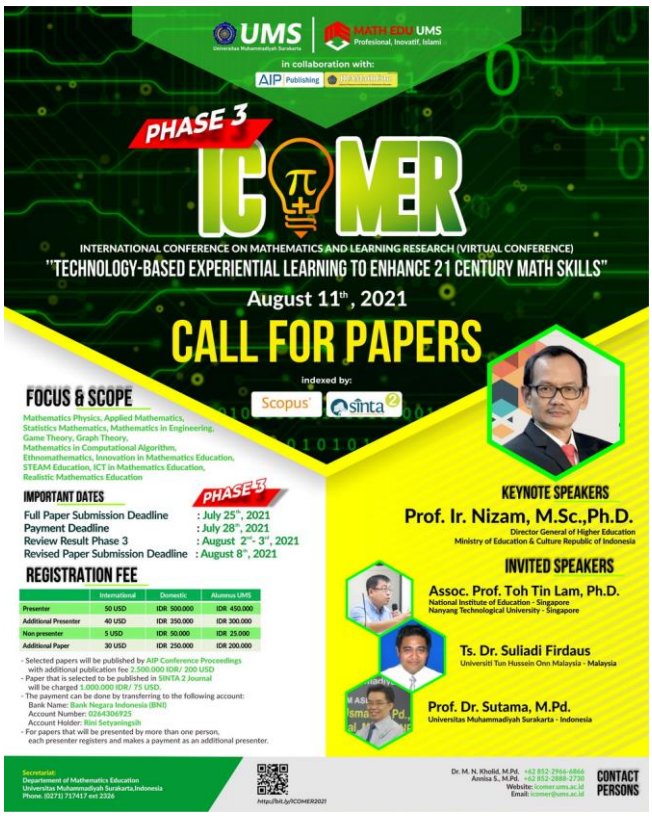

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International Conference on Mathematics and Learning Research (ICOMER) 2021

Surakarta, 11 Agustus 2021

PREFACE

The International Conference on Mathematics and Learning Research (ICOMER) held by Mathematics Education Department – Universitas Muhammadiyah Surakarta, Indonesia. It is a follow-up activity of the Konferensi Nasional Penelitian Matematika dan Pembelajarannya (KNPMP) V (see: knpmp.ums.ac.id). The first international theme is "Technology-based Experiential Learning to Enhance 21st Century Math Skills". We invite undergraduate/graduate/doctoral students, teachers, lecturers, and observers in the interest of mathematics and mathematics education to disseminate their research results. Welcome to The First ICOMER.

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INTERNATIONAL CONFERENCE ON MATHEMATICS AND LEARNING RESEARCH

ICOMER 2021-ISSN PROCEEDINGS & JRAMATHEDU

CLUSTERING AND MAPPING OF DHF IN WEST JAVA WITH PURELY SPATIAL SCAN STATISTIC ANALYSIS USING DISCRETE POISSON MODEL

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Abstract. DHF (Dengue Hemorrhagic Fever) is one of the epidemiological diseases that contagious, can cause death in a short period of time, and frequently causes an outbreak. The disease is transmitted by Aedes aegypti and Aedes albopictus mosquitos. Except in places with altitudes of more than 1,000 meters above sea level, both types of mosquitos are found in tropical and subtropical regions of the Indonesian archipelago to northern Australia. In 2016, West Java Province had the highest DHF in Indonesia. Epidemiology is the science that studies the distribution, frequency, and determinants of a disease in order to solve health problems. To deal with DHF issues, map and cluster the dengue fever to determine which spreading and locations are at high risk for DHF. In this research, clustering and mapping of dengue disease in West Java in 2016 were analyzed using purely spatial scan statistic using the discrete Poisson model. Clustering analysis was used to identify high-risk DHF sites and to map the spread of DHF. Based on the research, it can be concluded that West Java Province has 17 clusters of DHF disease. The radius of the largest cluster is 47.14 km. The most DHF patients are found in Bandung City and Cimahi City clusters, with a total of 4,565 people.

VISUALIZATION OF RECTIFIED SINE WAVES AND TRIGGERING ANGLES ON THYRISTOR USING GEOGEBRA

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Abstract. GeoGebra is a tool that is widely used among academics to solve mathematical problems. GeoGebra can be visually generated in the form of graphs and computational results easily and quickly. In the field of electronic power, there is a problem with directed waves and waves triggered by a certain angle on the device thyristor. This paper will be discussed about visualization of rectified sine waveforms, triggering angles as well as integral values of directional waves in thyristor and three-phase source animation. With the GeoGebra tool, students can understand mathematical equations and make wave visualization on electronic power.

GENERALIZED LINEAR MODELLING ON COVID-19 CASES IN INDONESIA

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Abstract. The COVID-19 outbreak that has not stopped yet makes scientists keep conducting studies on this outbreak. Studies that are mostly done are about the prediction and modeling of COVID-19 data. In line with that, this study also discusses COVID-19 modeling. The model that is mostly used is the linear model. However, if the classical assumptions of normality are not fulfilled, a special method will be needed. The method that can overcome this problem is the generalized linear model (GLM) with the assumption that the data have an exponential family distribution. By using 3 types of exponential family distribution, the obtained best result is the GLM with the Gaussian distribution.

DEVELOPMENT OF WAREHOUSE DATA MODELS TO SUPPORT JNE DELIVERY SERVICES

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Abstract: In order to help improve the performance performance of JNE business actors in this globalization era, it is necessary to encourage them to compete with each other in acquiring technology to support all their work activities so that they can be carried out as effectively and efficiently as possible, due to the increasingly dominant role and technology. And the data warehouse is one of the concepts oriented to the core components of a business, that is, data can be categorized as a strategic supporting aspect because through the formation of a data warehouse an output can be obtained in the form of a report that can be used as analysis material for the executive in the decision making process .

The objectives to be achieved in this research are to formulate a data warehouse model and application design in accordance with the results of the needs analysis, which in turn can support JNE business actors as a delivery service, which in this study involves JNE Klaten as the object of research.

The methodology used in this study uses design and analysis methods. The design method is carried out by designing a data warehouse application, as a display interface that contains supporting features from the user side and the method of analysis is carried out by studying literature, conducting surveys and interviews, identifying information needed by executives in decision making, and defining data warehouse requirements. which will be built based on Nine-Steps Methodology.

The results of the research are in the form of data warehouse models and applications that are formed based on operational data, which are processed in various dimensions, so that they can form a report to meet the needs of the executive about information, that with a data warehouse, the executive can analyze the reports generated from multiple viewpoints easily, and can also be used as a reporting tool.

ETHNOMATHEMATICS 4.0 : HYPOTHETICAL LEARNING TRAJECTORY IN MAKING MATHEMATICS LEARNING VIDEOS BASED ON INDONESIAN CULTURE

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Abstract

So far, design research has focused on student learning trajectories. This research was conducted to determine the hypothetical learning trajectory in making learning videos with ethnomathematical concepts. The method in this research is design research with preliminary design steps, experimental design and retrospective analysis. The subjects in this study were prospective mathematics teachers who had carried out educational internships and some participated in the campus program teaching the ministry of education and culture of the Republic of Indonesia. The result of this research is a hypothetical learning trajectory design in making learning videos using ethnomathematical concepts with learning trajectories, namely how prospective teachers produce learning videos using regional cultures that are adopted into mathematical concepts. The activities carried out in this research consist of analysis, designing, testing, and producing. From the four activities, the term ethnomathematics 4.0 appears which represents the use of culture-based mathematics learning media using technology. Through ethnomathematics learning videos, culture-based mathematical concepts can be accessed by anyone and at any time with the digitalization system which is the pillar of the industrial revolution 4.0

ERROR ANALYSIS OF CLASS VIII STUDENTS IN UNDERSTANDING MATHEMATICS PROBLEMS IN THE PISA MODEL AT MTS TERPADU NURUL HIDAYAH TANGEN FOR THE 2020/2021 ACADEMIC YEAR

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This study was conducted with the aim of knowing and describing the causes of students making mistakes in understanding the PISA model math problems on the Number Pattern material. This type of research is descriptive qualitative research. The subjects in this study were class VIII MTs Terpadu Nurul Hidayah Tangen students for the 2020/2021 academic year. Data collection techniques used in this study were tests, interviews, and documentation. The validity of the data using triangulation techniques. The data analysis technique was carried out in three stages, namely data reduction, data presentation, and data verification and conclusion drawing. The analytical framework was developed based on the Newman error category. The results showed that the number of errors made by students in understanding the PISA model questions was 23.29%.

STUDENTS' MATHEMATICAL CRITICAL THINKING ABILITY IN GROUP ALGEBRA STRUCTURE COURSE DURING THE COVID-19 PANDEMIC

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Abstract. Critical thinking skills are very important things that students must have during online learning. Critical thinking skills are useful for solving specific problems and being able to develop in a better direction. The purpose of this study is to analyze students' mathematical critical thinking skills in solving problems in the Group Algebraic Structure course during the Covid-19 Pandemic. The research method used in this research is descriptive qualitative research using written tests and interviews. From the results of the study, it was found that students with very high critical thinking levels were 20%, high critical thinking levels were 50%, moderate critical thinking levels were 23.33%, low critical thinking levels were 3.33% and very low critical thinking levels were 3.33%. Furthermore, from the results of the written test, 5 subjects were taken based on each indicator of mathematical critical thinking skills to be confirmed through interviews. From each student who has very high, high, medium, low and very low mathematical critical thinking skills, students have different achievements from each indicator.

MATHEMATICAL REASONING ABILITY OF JUNIOR HIGH SCHOOL STUDENTS DURING THE COVID-19 PANDEMIC IN SOLVING HOTS QUESTIONS FOR CIRCLE MATERIAL

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Abstract. This study aims to determine the mathematical reasoning ability of junior high school students during the covid-19 pandemic in solving HOTS questions on circle material. This research uses descriptive qualitative method. The research subjects were six eight grade students at SMP Muhammadiyah 1 Kartasura. Data collection techniques using tests and interviews. Data analysis using data reduction techniques, data presentation, and drawing conclusions. The results showed that students with high mathematical reasoning abilities were able to fulfill all indicators of mathematical reasoning well and solve all questions correctly. Students with low mathematical reasoning abilities are only able to fulfill the indicators of presenting mathematical statements well and are not able to able to solve all questions correctly.

IMPLEMENTATION OF REFLECTIVE THINKING PROCESS APPROACH TO STUDENTS' MATHEMATICAL CRITICAL THINKING

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This study aims to measure students' mathematical critical thinking skills after learning by using a reflective thinking process approach. The research design used was an experimental research method with a quantitative approach. The research design used was a One Shot Case Study with a pre-test. The population in this study was students of SMPN 1 Takengon, meanwhile the sample was class VII2 students of SMPN 1 Takengon with consideration of heterogeneous students' abilities selected by purposive sampling. A mathematical critical thinking test instrument and a student's attitude scale questionnaire was applied as the data collection of this study. The results of the research showed; (1) the improvement of students' mathematical critical thinking skills who get learning using a reflective thinking process approach was better than learning without a reflective thinking approach; (2) the reflective thinking approach had an effect of 53.6% on increasing students' critical thinking skills; (3) students showed a positive attitude towards learning mathematics, and also towards mathematical critical thinking questions

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ETHNOMATEMATIC STUDY: CULTURAL VALUES AND GEOMETRIC CONCEPTS IN THE TRADITIONAL *TANEAN LANJANG* HOUSE IN MADURA – INDONESIA

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The purpose of this study is to examine geometric concepts in the traditional *Tanean Lanjang* house in such a way that they can be useful in learning mathematics. Traditional Madurese architecture in general and traditional Madurese residences in particular are one of the cultural treasures and heritage in East Java, Indonesia. The kinship system found in Madura is marked by the formation of house units, each of which is inhabited by a main family (called by *batih* family). One of the units of the house is called *tanean lanjang*. This research is a qualitative study with an ethnographic approach to describe, explain, and analyze the geometric concepts found in the traditional house of *Tanean Lanjang* settlement in Madura. The data of this research are library data, ethnographic notes, and documentation (photos). Data analysis techniques were carried out by data reduction, data presentation, data interpretation/research findings and drawing conclusions. The results of this study are the cultural values and geometric concepts contained in the traditional house of *Tanean Lanjang* in Madura. The cultural values contained in this *tanean lanjang* house include: (a) kinship and brotherhood values, (b) harmony in the household, and (c). strength in the household. The geometric concepts contained in the *tanean lanjang* traditional house include: 2-dimensional shape (i.e rectangle, trapezoid, triangle), perimeter of 2-dimensional shape , area of 2-dimensional shape, 3-dimensional shape (i.e triangular prism), volume of 3-dimensional shape, angle, curve, and the concept of transformation in geometry (reflection).

THE DEVELOPMENT OF STEAM-INTEGRATED TEXTBOOK IN STATISTICS MATERIAL

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This development research aims to develop and determine the quality of integrated mathematics teaching materials science, technology, engineering, art, and mathematics (STEAM) in Statistics material. The research method uses the modified Sugiyono development model, including, 1) potential dan problems; 2) data collection; 3) product design; 4) design validation; 5) product test (readability test); and 6) the final product. The data collecting instrument used a questionnaire given to six experts to determine the validity of teaching materials and a readability test given by students to determine the practicality of teaching materials. The result showed that the teaching materials were valid with a validity test percentage of 88,99% and a readability test percentage of 80,62%. Thus, integrated teaching materials for science, technology, engineering, art, and mathematics (STEAM) are of high quality because they meet the suitability of characteristics, valid to use, and practical or easily understood by students.

PENINGKATAN PEMAHAMAN KONSEPTUAL MATEMATIS DAN HASIL BELAJAR MATEMATIKA SISWA MELALUI PEMBELAJARAN KONTEKSTUAL DENGAN *MARKET PLACE ACTIVITY* (MPA)

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Penelitian ini bertujuan untuk mengetahui sejauhmana penerapan pembelajaran kontekstual dengan Market Place Activity (MPA) meningkatkan pemahaman konseptual matematis dan hasil belajar matematika siswa. Penelitian ini merupakan Penelitian Tindakan Kelas (PTK) yang dilaksanakan dalam 2 siklus, masing-masing siklus terdiri atas empat tahapan yaitu: perencanaan, tindakan, observasi, dan refleksi. Subjek pada penelitian ini adalah 31 siswa kelas XII TKRO 2 semester gasal SMK Negeri 2 Sragen tahun pelajaran 2019/2020. Teknik pengumpulan data menggunakan teknik tes, observasi, catatan lapangan, dan dokumentasi. Analisis data dilakukan dengan model analisis interaktif yang terdiri dari proses pengumpulan data, penyajian data, dan verifikasi data. Hasil penelitian ini menunjukkan bahwa penerapan pembelajaran kontekstual dengan MPA dapat meningkatkan: 1) pemahaman konseptual matematis siswa: rata-rata persentase dari masing-masing aspek yang diamati pada tahap Pra Siklus, Siklus I, dan II adalah 56,53%; 74,35%; dan 86,48%; 2) hasil belajar matematika siswa: pada tahap Pra Siklus, Siklus I, dan II nilai rata-rata kelas pada aspek pengetahuan berturut-turut adalah 65,45; 71,03; dan 77,77, dengan ketuntasan belajar berturut-turut adalah 25,81%; 51,61%; dan 83,87%. Berdasarkan hasil penelitian dapat disimpulkan bahwa penerapan pembelajaran kontekstual dengan MPA dapat meningkatkan pemahaman konseptual matematis dan hasil belajar pada mata pelajaran matematika siswa kelas XII TKRO 2.

RESEARCH TRENDS ON COMPLEX PROBLEM SOLVING IN MATHEMATICS EDUCATION: A SYSTEMATIC REVIEW

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ABSTRACT
The number of research in the field of mathematics education is always increasing from year to year. Researchers in the field of mathematics education are also growing. This makes the research on article review very important to do, because it can help researchers in determining the research to be done. In this study, a review of research articles on complex problem solving (CPS) in mathematics education was conducted. Researchers have investigated complex problem solving, but what is being studied varies. The purpose of this article is to provide an overview of complex problem solving discussed in mathematics education research. In this study, we analyzed 38 published articles from 2013-2020. We search for articles in a Web of Science database with a single keyword or keyword combination. Keywords or combinations of keywords used include complex problem solving, a combination of complex problem solving and mathematics. We conducted a systematic review of inductive cesara finding complex problem solving discussed in math education. We found there are still many things that have not been researched by researchers. Researchers are predominantly from the United States with the topic of assessment and measurement of CPS. This article also provides an overview of complex problem solving research that has different focal points, namely the process of cognition, metacognition, working memory, intelligence, motivation, and complex problem solving ability. Based on this search, we use a systematic approach to inductively have not found complex problem solving discussed in mathematics education research. There are still many complex problem solving skills in mathematics education that have not been explored. Thus, there is still a lot of material excavated in research activities.

SYSTEMATIC LITERATURE REVIEW: ALGEBRA THINKING PROCESS IN MATHEMATICS LEARNING

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Abstract. Responding to difficulties in algebraic problems, many studies describe algebraic thinking at the education unit level as a way to algebra. Several studies have shown the difficulties of students with algebraic thinking and the challenges of teachers in creating contexts that support algebraic thinking skills. The goal of this research is to perform an algebraic thinking literature review. The SLR (Systematic Literature Review) approach was used as the research method in this study. Data was gathered by collecting and evaluating all publications on algebraic thinking that were published between 2015 - 2021. The article presents constructivist-based theories about interdependent practices that support algebraic thinking skills. The articles used in this study were 12 international journal articles and 11 nationally accredited articles obtained from the database, ScienceDirect, Google Scholar, Mendeley using the Publish or Perish application. Based on this study, it was found that high effect size was

obtained in the category of junior high school participants in the form of the application of the learning model used in improving the algebraic thinking skills of junior high school students.

NUMERICAL LITERACY IN MATHEMATICAL PROBLEM SOLVING: A BRIEF LITERATURE REVIEW

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Abstract. Currently, the issue of literacy is being hotly discussed in Indonesia. A nation with a high literacy culture shows the nation's ability to collaborate, think critically, be creative, and communicative so that it can win the global competition. One of the literacies that are being promoted in Indonesia is numeric literacy. An important study was conducted to investigate the effectiveness, as well as the impact of various approaches used in developing numeracy literacy from elementary school to university level students. Therefore, in this study, a systematic review of numeracy literacy was carried out. This review synthesizes findings from existing research of various approaches used to investigate numeracy literacy between 2017-2021. Obtained 12 titles from the results of quantitative and qualitative research. The research method chosen in this study is the SLR (Systematic Literature Review) method. Data collection is done by documenting and reviewing all articles related to numeracy literacy published in the period 2017-2021. The articles used in this study were 12 articles of accredited and unaccredited national journals obtained from the Google Scholar and Scopus databases using the Publish or Perish application. The results of the review reveal that students with low numeracy literacy are less able to convey information well or in other words, student numeracy literacy affects students' communication skills, numeracy literacy in thematic learning of upper-grade elementary school students can be done by providing stimulus to students to stimulate students' curiosity, students with good numeracy literacy can solve unstructured problems. The difficulties experienced by students are difficulties in understanding the questions; lack of students' understanding of the prerequisite material; difficulty developing a strategy of completion; and difficulty in concluding, it is not always true that if you know mathematics you always have good numeracy skills, elementary students with high mathematical problem-solving abilities have good numerical literacy. Suggestions from the results of this systematic literature review are to find ways so that students with low abilities can convey information well, to bring students to be numeric literate, it is necessary to provide a stimulus to encourage student curiosity.

STUDENTS' CREATIVE THINKING ABILITY THROUGH LEARNING REALISTIC MATHEMATIC EDUCATION (RME) FOR JUNIOR HIGH SCHOOL STUDENTS.

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In general, Mathematic learning for Junior High School students in East Lombok Regency has not been aimed at developing students' creative thinking ability, students are given a routine exercise or close exercise whereas answering questions is the main focus. Meanwhile, non-routine problem has never been introduced. Creative thinking is one of the pillars in finding solutions to problem. In order to find and apply various ideas, as well as trained in finding and solving the problem Creative thinking Ability is crucial. Therefore, all students' Creative Thinking Ability must be improved. One of the tools in improving Students' Creative Ability can be reached through *Realistic Mathematic Education* (RME) Approach. RME approach requires the students to be more active in finding certain concepts by constructing their comprehension and contribution during learning process. This research is aimed at understanding the differences on students' Creative thinking ability using Realistic Mathematic Education (RME) compare to direct learning. This research used Pottest-Only Control Group Design. Sampling technique used

is purposive sampling and to know the differences between two groups, data analysis is conducted by –t testing. From data analysis, it can be concluded that: it is found that students who learn through Realistic Mathematic Education approach has obtained average score of 63,00 higher than control group 54,30.

BLENDED LEARNING THROUGH LEARNING MANAJEMENT SYSTEM IN MATHEMATIC OF STATISTIC AND OPPORTUNITY : STUDENTS' PERCEPTION

Ahmad

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ABSTRACT
Due to the COVID-19 pandemic, face-to-face mathematics instruction is currently unavailable in classrooms. As a result, changing face-to-face learning in schools to online learning is one of the government's initiatives and tactics in reducing the spread of the corona virus. Student perceptions have a significant part in enhancing students' role, activeness, and progress during the learning process in order to attain learning objectives. As a result, the goal of this research was to find out how senior high school students perception about blended learning though LMS in mathematics during the covid-19 pandemic. This study employs descriptive quathitative methods with 47 sudents of grde IX in SMP Negeri 2 Sokaraja as a respondent of the study. Questionaire was used to collect the data. According to the findings of the study, Class IX students' perceptions of online learning in subjects Mathematics in the Covid-19 Pandemic at SMP Negeri 2 Sokaraja are in moderate category with a percentage of 6. percentage of 42.56%.

INDONESIAN MATHEMATICS TEACHERS' VIEWS ON DISTANCE LEARNING BARRIERS DURING THE EARLY OF COVID-19 PANDEMIC

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ABSTRACT
This paper aims to describe the views of Indonesian mathematics teachers on the distance learning barriers during the early of Covid-19 pandemic. Specifically, this paper investigates the barriers that Indonesian mathematics teachers view as significant in distance learning during the early of Covid-19 pandemic and efforts taken by Indonesian mathematics teachers to overcome distance learning barriers during the early of Covid-19 pandemic. This study used online questionnaire and involved 415 mathematics teachers as the participants. This study shows that barriers related to pedagogical dimensions perceived as significant in distance learning during the early of Covid-19 pandemic. Moreover, this study reveals that most of the teachers took some efforts that can be done by the teachers themselves to overcome the barriers.

THE DEVELOPMENT OF PROBLEM-BASED STUDENT WORKSHEETS TO IMPROVE MATHEMATICAL REASONING ABILITY IN CLASS XI STUDENTS OF SMA NEGERI 6 SURAKARTA

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ABSTRACT

This study aims to develop a valid, practical and effective problem-based Student Worksheet (LKPD) in improving the mathematical reasoning ability of students in class XI IPS 1 SMA Negeri 6 Surakarta. The development research method used is a 4-D model, including Define, Design, Develop, and Dissemination. The subjects in this study were students of class XI IPS 1 SMA Negeri 6 Surakarta. Data collection techniques used interviews, questionnaires, observations, and tests of mathematical reasoning abilities. Analysis of the data used is an analysis of the validity, practicality, and effectiveness of LKPD using criteria scores and test results of mathematical reasoning abilities through a t-test with a significance level of 5%. Based on the analysis results, the developed LKPD meets the criteria of being valid, practical, and effective. Problem-based LKPD is valid with a percentage of 79% of the average results of expert assessments and readability tests; practical with a rate of 86% of the average results of observations of the implementation of learning and student responses; effective because there is an increase in students' mathematical reasoning abilities after using LKPD with an effective level of 0.47 including in the medium category.

IMPROVEMENT OF PROSPECTIVE TEACHER MATHEMATICS REASONING ABILITY USING NUMERATION LEARNING ASSISTED E-LEARNING OF PGSD UNIVERSITAS PGRI PALEMBANG

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ABSTRACT

This study aims to examine the improvement of prospective teacher Mathematical Reasoning (KPM) abilities through E-Learning-assisted Numeration learning. This study used a quasi-experimental method with a non-equivalent pretest and posttest control group design. The subjects of this study were mathematics prospective teacher at PGRI Palembang University. namely the experimental class which received E-learning assisted numeracy learning (PNBE) and the control class which received conventional learning (PK). Based on the results of the analysis of the difference in the mean difference in the KPM increase of prospective teacher who received PNBE learning and prospective teacher who received conventional learning, the scores from the table of increasing KPM of students who received E-learning-assisted Numeration learning (PNBE) were better than prospective teacher who received conventional learning. Based on the results of data analysis, it can be concluded that (1) numeracy skills and mathematical reasoning abilities of fourth semester prospective teacher PGSD at PGRI university are quite good. (2). It is recommended for teaching staff/lecturers to be able to try out this learning model on other mathematical abilities.

LEARNING IN THE PANDEMIC PERIOD BY USING AN ANDROID-BASED MATHEMATICAL COMIC APPLICATION ON CARTESIAN COORDINATE MATERIAL

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The purpose of this study is to describe the application of learning using an Android-based math comic application on Cartesian coordinate material and to determine the differences in learning outcomes between the control class and the experimental class. The developed mathematics comic application is adapted to the PEDATI learning pattern in the blended learning model. This study uses a mixed research model. The type of data used comes from observations during learning and student learning outcomes. The research subjects were students of class VIII SMP Muhammadiyah 4 Singosari. The results of the normality test obtained significance (sig) > 0.05, indicating that the data in the control class and experimental class were normally distributed. The results of the homogeneity test showed a significance (sig) > 0.05, which indicates that the control class and the experimental class had homogeneous variants. The results of the Independent T-test obtained significance (sig) > 0.05, so it can be concluded that the learning outcomes of the experimental class are better than the control class. The results of the assessment show that the android-based math comic application is declared valid, practical, and effective to be used as a learning medium in Cartesian coordinate material.

UTILIZATION OF SCHOOL WEB AS ONLINE LEARNING MEDIA IN PANDEMIC ERA

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Utilization school web as online learning media rarely implemented optimally by many schools. Therefore, we need a discussion about utilization of school web as online learning media. There are three purposes of this research. 1) Describe the planning of school web utilization as instructional media online. 2) Analyzing the implementation of school web utilization as instructional media online 3) Describe the evaluation of school web utilization as instructional media online. This type of research is a qualitative research with a phenomenological design. The research was carried out at SMPN 1 Teras in the 2020/2021 academic year. The object of research is the use of the school's web as an online learning media with research subjects consisting of 9 students of class VIII, mathematics teachers and vice principal of SMPN 1 Teras. Data collection techniques using interviews, observation and documentation. The validity of the data using triangulation of sources and techniques. Data analysis was carried out through 3 paths, namely data reduction, data presentation, and drawing conclusions. The result of the research is that the use of the school's web as an online learning media is divided into 3 stages including planning, implementation and evaluation. The planning stage includes the background, planning, tools that need to be prepared and the content of the school web. The implementation stage includes the use of the school's web, student responses, student activity and material delivery in online learning. The evaluation stage includes responses, advantages and disadvantages of using the school web. The use of the school web as an online learning media at SMPN 1 Teras is quite good. The school web can be used as an alternative learning media that is effectively used during the pandemic.

HYPOTHETICAL LEARNING TRAJECTORY (HLT) TO BUILD UNDERSTANDING OF MATHEMATICS EDUCATION STUDENTS ABOUT WHAT IS AND HOW TO APPLY PROBLEM BASED LEARNING (PBL) TO LEARN MATHEMATICS

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This study aims to (1) find out how Hypothetical Learning Trajectory (HLT) in problem base learning on teh topic of volume and surface area of a cube; (2) find out how the understanding of S1 students who take class D Micro Teaching courses regrading teh Problem Based Learning model. This type of research is design research. The subjects in this study were 15 students who took the Micro Teaching course in class D. The data analysis used in this study was data analysis by Miles and Huberman, namely reducing data, presenting data, drawing conclusions and verifying. In general, the research steps carried out are (1) the researcher conveys the learning objectives, namely helping students understand problem based learning; (2) the resercher gives apperception to the topic that is used as a problem-solving medium; (3) the researcher conveys the problem to be solved by the students; (4) students solve the problems given and are guided by researcher, then students present them; (5) evaluate the results of problem solving, then students draw conclusions from the activities they do during learning. Based on the results of interviews after going through the learning process, it can be concluded tha eleven students can only explain that PBL must begin by solving problem that aim to find a Mathematical concept, and four students can explain how the stages of learning that must be passed by students starting from giving problems to by discovering a Mathematical concept.

STUDENTS' AFFECTIVE SKILLS LEVEL AND THEIR IMPACT ON MATHEMATICS LEARNING OUTCOMES

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Affective skill is one of the factors that must be possessed by students and are the key to successful learning, affective skills is also one of the skills needed in the world of work in the future. This quantitative study aimed to analyze the level of affective skills and their influence on learning outcomes, as well as to analyze the dominant influencing variables. This research was a quantitative survey research conducted in January-March 2021 involved 155 students of SMA Negeri 4. The variables consisted of exogenous variables, namely affective skills (math interest, math anxiety, math self-efficacy, beliefs, and math attitude), while endogenous variables are learning outcomes. The instrument used to measure exogenous variables was a questionnaire that met the validity and reliability tests. While the endogenous variable, namely learning outcomes obtained from the value of documentation of student learning outcomes at school. The data was processed by descriptive analysis and inferential analysis through structural equation modeling (SEM). The results of the study concluded that math self-efficacy and math attitude were in the high category, beliefs and math interest were in the sufficient category, and math anxiety was in the low category. Furthermore, math interest, math self-efficacy, beliefs, and math attitude were found to have no significant effect on learning outcomes, which means that math interest, math self-efficacy, beliefs, and math attitude were not sufficient to provide evidence that they were able to significantly influence learning outcomes. whereas math anxiety had a significant negative influence on learning outcomes, which means that the less math anxiety students possessed, the higher the student's learning outcomes be. Thus, math anxiety was a variable that had a dominant impact on mathematics learning outcomes.

THE DEVELOPMENT OF MATHEMATICS MODULE BASED ON THE CONTEXTUAL APPROACH IN ALGEBRAIC FORMS MATERIAL IN THE VII GRADE OF JHS

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ABSTRACT
The purpose of this study was to determine the process and results of developing a mathematics module based on the contextual approach in algebraic forms which was valid, effective, and practical in the VII grade of JHS. This study was research and development (R&D) adapted from the ADDIE development model. The product developed was a mathematics module containing algebraic form materials based on the contextual approach, the subject of the study were students of junior high school. Data collection techniques in this study were validation sheets, questionnaires, learning outcomes tests, and observation sheets. The data analysis technique used was descriptive data analysis. Based on the research findings, it was found that the process of developing teaching materials in this study using the ADDIE instructional development model included five stages, namely analysis, design, development, implementation, and evaluation. The mathematics module has met the criteria of validity, effectiveness, and practicality, which means that this module is suitable to be applied in the interaction of teaching and learning activities.

DEVELOPING INTERACTIVE LEARNING MEDIA BASED ON MACROMEDIA FLASH APPLICATION ON THE MATERIAL OF POLYHEDRON

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ABSTRACT
This study aims to determine the process of developing interactive learning media in a valid, practical, and effective material of polyhedron. This research used Research and Development (R&D) with ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. The developed product was interactive learning media based on the Macromedia Flash application, then tested on students. The collecting data techniques used in this study were questionnaires, observation, and learning outcomes tests. The instruments used were expert validation sheets, teacher and student questionnaires, and student learning outcomes tests. The data analysis technique used was descriptive data analysis. Based on the validation results from experts related to instructional media, teacher and student response questionnaires and learning outcome tests were categorized as very valid. Referring to the analysis of teacher and student responses, they generally gave positive responses, which means that this learning media was considered practical. In addition, the average test result of student learning fulfilled the minimum completeness criteria, so it was assumed to be effective. Thus, interactive learning media based on the Macromedia Flash application was considered valid, practical, and effective.

EFFECT OF INDEPENDENT STUDENT LEARNING ON PROBLEM SOLVING USING THE WORKSHEET GEOMETRY BASED ON PJBL

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ABSTRACT
The Independent learning and problem-solving abilities of students who are still weak are the backgrounds of this research. This study aims to determine the effect of student learning independence on student problem-solving abilities through the application of the worksheet based on Project Based Learning at Universitas Negeri Padang. This study uses One-Shot Case Study research design. The data analysis technique used simple linear regression analysis. The regression coefficient of the questionnaire score (b) is 0.715 with a significant level of 0.05. Because the regression coefficient (b) is positive (+). So there is a positive influence between learning independence (X) on students' problem-solving abilities (Y). The close linear relationship between X and Y can be seen from the correlation coefficient r = 0.148 which means that it is close to 0, then the linear relationship between X and Y is weak. The conclusion is that learning independence has an effect on problem-solving abilities through the use of the worksheet based on Project Based Learning in the Spatial Geometry course

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THE EFFECT OF APPLIED STATISTICS AND DISTANCE ADVISORY TOWARDS THESIS COMPLETION OF POLYTECHNIC STUDENTS IN COVID-19 PANDEMIC ERA

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ABSTRACT
Polytechnic research, including the thesis study from the Polytechnic students, has so many aspects that can be improved or collaborated with other fields. One of the study fields that is very applicable with Polytechnic research is Applied Statistics. This research aims to see the effects of Applied Statistics and distance advisory towards thesis completion of Polytechnic students in COVID-19 pandemic era. Distance advisory is included in this study because COVID-19 gives a significant effect towards students' thesis completion, including Polytechnic students. Though they were not familiar with the approach of distance advisory, Polytechnic students already applied it as the method to complete their thesis since the condition forced them to do so. The research used multiple regression by analyzing the data gathered from questionnaire. It was determined that both Applied Statistics and distance advisory simultaneously has positive and significant effects towards thesis completion of Polytechnic students in COVID-19 pandemic era. Partially, only Applied Statistics give positive and significant effects, while distance advisory alone statistically has no significant effects. Therefore, this research concluded that both applied statistics and distance advisory are recommended for Polytechnic students to enrich the quality of their thesis study.

PROFILE OF STUDENT GEOMETRY SKILLS IN TERMS OF MATHEMATICS ANXIETY

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ABSTRACT
The geometry skills that students have must vary according to the level of math anxiety they have. This qualitative study aims to determine students' mathematical anxiety and identify geometry skills in terms of mathematical anxiety on prism and pyramid material. The research subjects were eighth-grade students. The level of students' mathematics anxiety was measured by a questionnaire. Students' geometry skills were measured by a diagnostic test based on Hoffer's theory. Furthermore, in-depth interviews were conducted. The results showed that the eighth-grade students had varying mathematics anxiety where male students had higher mathematics anxiety than female students. Boys and girls with high mathematics anxiety levels had low visual geometry, verbal, logical, drawing, and applied skills. Male students at the moderate level of mathematics anxiety had high visual geometry, drawing, and applied skills, and low verbal geometry and logical skills. Meanwhile, female students have high visual geometry skills, and low verbal, logical, drawing, and applied geometry skills. Male students at low mathematics anxiety levels have high visual geometry, logical, drawing, and applied skills and have low verbal skills. Meanwhile, female students have high visual, verbal, logical, drawing, and applied skills.

DEVELOPMENT OF SPATIAL ACTIVITIES BOOK

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ABSTRACT
Spatial skills are needed in learning Mathematics. Spatial skills support students in recognizing the shape of spatial objects, relating, and mentally orienting it. The purpose of this research is to produce an interesting and practically spatial activities book. The steps taken are to conduct a preliminary study, design, and product assessment. In the preliminary study, a recommendation was obtained that it is necessary to develop a book containing spatial activities. At the design stage, the book preparation process begins with the preparation of book maps, character creation, and book layout. The result of the design stage is a draft book entitled *Petualangan di Pulau Vireon bersama Tiga Sahabat*. The assessment stage is carried out through two stages, namely the assessment of media experts and material experts and the assessment of book users. The results of the expert assessment provide recommendations that the activity book can be used with some improvements. While the test results give the result that the activity book is interesting and easy to work on. The activities book have enough space to answer questions, answer keys, each mission is given a visual display interesting and helps students in imagining spatial objects, and there is feedback at the end of each mission so that students are motivated to participate in completing the mission. Thus, the activities book entitled *Petualangan di Pulau Vireon* is an interesting and practically book that can be used to improve spatial skills.

LIST OF ABSTRACTS

INTERNATIONAL CONFERENCE ON MATHEMATICS AND LEARNING RESEARCH

ICOMER 2021-AIP CONFERENCE PROCEEDINGS

HILL CLIMBING ALGORITHM FOR BAYESIAN NETWORK STRUCTURE

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Abstract. Bayesian Network (BN) model is a method developed to describe causal relationships between variables in a system. BN is a form of Probabilistic Graphical Model or a simple probabilistic graph built from Bayes probability theory and graph theory. There are two approaches used to construct the BN structure, namely the constraint-based method and the score-based method. The scored-based method is a method that assigns a score to each structure in BN and tries to maximize the scoring with several heuristic search algorithms. The scoring is done by using the Bayesian Information Criterion (BIC) scoring function. In this study, scored-based is solved by the Hill Climbing (HC) algorithm. This algorithm is a value-based algorithm in a directed graph space and includes a heuristic search method that works greedily. The results of the study show that the use of the score-based method followed by the HC algorithm and the BIC scoring function can build the BN structure.

THE EFFECTIVENESS APPLICATION OF LEARNING MODEL WITH AUGMENTED REALITY ON DEAF STUDENT'S GEOMETRY LEARNING OUTCOMES

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Abstract. Previous studies have reported that many deaf students have difficulty explaining their conceptual understanding of two-dimensional geometry even though they may be familiar with these basic geometric concepts. The purpose of this study was to answer the problems related to the effectiveness of learning model application with augmented reality on deaf student's geometry learning outcomes, especially enhanced understanding of geometry concepts. A learning model with augmented reality (AR) that adapts the technology of the augmented reality (AR) framework, allows deaf students to see the real world while the virtual elements are combined with the real world. In this way, the augmented reality (AR) technology framework enriches students' perceptions of reality so that students can visualize abstract objects that were previously difficult for them to imagine, such as two-dimensional geometric objects. With this learning model, students' spatial ability and understanding of geometry concepts can be facilitated. The application of learning models with augmented reality (AR) can support students' conceptual understanding through their experiences, so it is a new opportunity to support the mathematics learning process. Students were tested before and after learning with the application of augmented reality (AR) technology. Paired sample t-test using SPSS was used to compare pretest and posttest scores to measure the effectiveness of implementing the learning model with AR to enhance students' understanding of geometry concepts. There was a statistically significant increase in a score (Sig. = 0.000), which indicates that the application of learning models with augmented reality (AR) in the classroom helps the learning outcomes of deaf students, especially their understanding of geometry concepts. In addition, students' positive responses indicate that the learning model with augmented reality (AR) provides an interesting way to learn two-dimensional concepts.

INCREASING THE COMPETENCE OF JUNIOR HIGH SCHOOL TEACHERS IN BOGOR REGENCY

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Abstract. Providing high-order thinking skills is one of the main goals in the 21st-century learning concept which aims to form toughness and high-quality thinking skills in analyzing, evaluating, and looking for alternative solutions to the problems at hand. One of the efforts that can be made to improve teacher competence in the 21st-century learning concept is by organizing a Professional Development Program (PK) through Increased Learning Competence (PKP). This research is a quantitative study using the one-group pretest-posttest design method. The population in this study were subject teachers throughout Bogor Regency. Sampling was carried out using convenience sampling. The objectives of this study were 1) how is the provisioning process for target teachers in Bogor Regency to have learning competency skills that can train students in solving HOTS questions, 2) whether there is an increase in the learning competence of target teachers. This research is a quantitative study using the one-group pretest-posttest design method. Statistical tests were carried out twice, namely before the training process (pretest) and after the training process (posttest). The population in this study were subject teachers throughout Bogor Regency. Sampling was carried out using convenience sampling. The sample of this study was 20 junior high school mathematics teachers in Bogor Regency. The instrument used in this study was a test. The test instrument consists of a comprehension ability test in the form of short answers and problem-solving in the form of a description. The material being tested was HOTS-based junior high school mathematics.From the results of this study, it can be concluded that (1) The process of debriefing the target teachers (impact teachers) in the Bogor Regency was carried out for 5 days. The material given is grouped into 4 families, namely Algebra, Geometry and Measurement, Number Theory, and Statistics and Chances. The master trainer provides teaching to the target teacher/teacher the impact of teaching the HOTS form, followed by working on HOTS questions. (2) There is an increase in the learning competence of target teachers (impact teachers).

TEACHERS' PERFORMANCE DETERMINANTS (QUANTITATIVE APPROACH TO THE MIDDLE SCHOOL TEACHER PERFORMANCE IN SALATIGA)

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Abstract. This study aims to investigate the influence of principal leadership and organizational commitment on teacher performance. This study uses quantitative research and questionnaires as data collection instruments. Purposive sampling was used with a group of 150 teachers from Salatiga's State Junior High Schools. This research employs a multiple linear regression model to determine the magnitude of the independent variable's effect (principal leadership and job satisfaction) on the dependent variable (teacher performance). The findings indicated that principal leadership had a positive impact on teacher performance. Job satisfaction had a positive effect on teacher performance. Both principal leadership and job satisfaction affected teacher performance simultaneously.

APPLICATION OF THE MODEL-ELICITING ACTIVITIES (MEAs) APPROACH ON MATHEMATICS TROUBLESHOOTING ABILITY

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Abstract. Mathematical problem-solving skills are needed in various aspects of life because of their relationship when making decisions that are most effective in solving problems. Learning with the Model-Eliciting Activities (MEAs) approach can be an effort to support students' mathematical problem-solving abilities. The purpose of this study was to investigate whether the increase in mathematical problem-solving abilities of students who received learning with the MEAs approach was higher than conventional learning and the attitudes of students who received learning with the MEAs approach. The research method used is experimental research using a quasi-experimental design with a pretest-posttest nonequivalent control group design. The research population is the seventh-grade students of SMP Parigi, South Tangerang. The research sample was class VII.5 as the experimental group and class VII.3 as the control group. Sampling was done by convenience sampling technique. The instrument used is a problem-solving ability test. The Mann-Whitney test on the final data showed that the increase in the experimental group's n-change data was greater than that of the control group. Or it could be said that the increase in the mathematical solving ability of the experimental group students was greater than the control group and the experimental group students showed a positive attitude towards learning.

ERROR CORRECTION MODELS (CASE OF DATA INFLATION IN INDONESIA)

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Abstract. Inflation is an important economic indicator. Always strive for a low and stable growth rate. High and unstable inflation is a reflection of the tendency to increase in prices for goods and services in general and continuously so that it can weaken the purchasing power of the people which will lead to a decrease in national income. Therefore, it is hoped that there will be a control over the inflation rate, which has recently shown a fluctuating graph. This study discusses the effect of changes in the rupiah exchange rate against the US dollar and changes in interest rates on changes in inflation in Indonesia which aims to model inflation in Indonesia using an error correction model. The results of this study indicate that changes in interest rates have a significant effect on changes in inflation, while changes in the rupiah exchange rate against the US dollar have no significant effect on changes in inflation.

Visualization of Similarity Characteristics among Regions in Ogan Ilir Regency, South Sumatera Province Based on the Covid-19 Category

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Abstract. This article describes the results of the data analysis of the Covid-19 case in the Ogan Ilir Regency of South Sumatera Province. There were some visualization graphs of similarity groups among 16 sub districts based on the Covid-19 case categories. Visualization similarity was drawn on a biplot graph based on the name of sub districts and some Covid-19 case categories. The implementation of social activity restrictions from the government policy was referenced as a way to split the time periods in analyzing data. The first period was an initial time that the pandemic breakout, the next period was the period of some social activities restriction in a large-scale area in Indonesia, then the new normal period. The biplot graphs showed that there were various grouping of sub districts in every period of time. There were differences in sub districts grouping from period to period. The variance and the correlation between two of the Covid-19 case categories differ from period to period. Nevertheless, there was a special note about some sub districts that tend to be solo groups separated from the other sub district groups in some periods. Those solo group of sub districts were Indralaya, Indralaya Utara, Pemulutan Selatan, and Sungai Pinang. The different result of grouping sub districts indicates that the handling Covid-19 case should be done by the different ways for the differ group. Those ways should consider the characteristics of sub district group in order to get the effective result in solving the Covid-19 pandemic. The different way should be considered for handling Covid-19 in the solo group of sub district. These analysis results were the simple visualization of similarities among sub districts that should be deeply investigated. Next research could be done for explorating, interpreting, or predicting the probability Covid-19 case using the others statistical method.

Students Mathematical Thinking Process with Symbolic Representation in Reconstructing Numerical Literacy Concepts

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Abstract. This study describes the mathematical thinking process of Vocational High School students in reconstructing the concept of numeracy literacy based on the framework of Action-Process-Object-Scheme (APOS) theory. This type of research is qualitative with an exploratory method in which students are allowed to take turns to solve problems until the research subject is found by the research objectives. The research subjects were 33 students of class IX Vocational High School PGRI 1 Kudus which were selected using exploration. Taking into account the variety of answers, the uniqueness of the answers, communication skills, and the fulfillment of the four indicators of numeracy literacy, one person was selected to participate in in-depth interviews. The data collection instruments used were numeracy literacy tasks and interviews. APOS theory is used to explore students' thinking processes in reconstructing the concept of numeracy literacy. The data analysis technique used is data reduction, data presentation, and conclusion drawing data. The results showed that students with symbolic representation type fulfilled the four indicators of numeracy literacy correctly. Subjects with this type have high numeracy literacy skills so that they can solve mathematical problems related to everyday life. Subjects carry out the process of representing literacy into mathematical symbolic forms in a structured and systematic manner.

ETHNOMATHEMATICS: FRACTAL GEOMETRY IN THE MOTIF OF *BUNA PANBUAT* WOVEN FABRIC OF THE AMANUBAN TRIBE, SOUTH CENTRAL TIMOR REGENCY

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Abstract. Fractal geometry is a branch of mathematics that studies the properties and behavior of fractals. A fractal is a shape that has a repeating pattern. This pattern has infinite detail which when enlarged can have a structure similar to the fractal itself. Many fractals are generated by recursively repeating patterns. This study aims to describe the fractal geometry contained in the motif of the *buna panbuat* woven fabric of the Amanuban tribe, South Central Timor district. This type of research is qualitative research with ethnographic methods. Collecting data in the study using observation, interview, and documentation techniques. The method used to calculate the fractal dimensions of the *buna panbuat* woven fabric motif is box-counting assisted by Matlab. The results showed that one of the applications of mathematical principles on the motif of *buna panbuat* woven fabric is the principle of fractal geometry, namely the principle of recursiveness. The fractal dimension of the *buna panbuat* woven fabric motif is 1.9, which means that the roughness and detail of the motif are high. This shows that in the practice of weaving, the Amanuban tribe has applied mathematical concepts in creating motifs on woven fabrics.

THE LEVEL OF CRITICALITY AND VISUAL INTELLIGENCE OF PROSPECTIVE MATHEMATICS TEACHER STUDENTS IN DESIGNING STEM-BASED LEARNING

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Abstract. One of the basic skills needed to face the 21st century is critical thinking skills and intelligence. Learning that is considered suitable for facing the challenges of the 21st century is STEM-based learning. Visualization is very helpful for solving problems. This paper discusses the level of criticality and visual intelligence of prospective mathematics teacher students in designing STEM-based learning. The research method used is descriptive exploratory research method with a qualitative approach. The research subjects were prospective mathematics teacher students of the PGRI Madiun University mathematics education study program in the 5th semester of the 2019/2020 academic year. Data were collected using task-based interviews. Source and time triangulation were used to validate the data. Valid data were analyzed by coding, data reduction, exposure, and categorization in order to obtain conclusions. The results showed that there were three levels of visual criticality of student mathematics teacher candidates in designing STEM-based learning. The first level, students do not / have not shown indicators of critical thinking visually. At this level, students are still fixated on mathematical calculations. The second level, students begin to show indicators of critical thinking visually. At this level, students have tried to find solutions using pictures, but have not succeeded due to a lack of criticality and visual intelligence. The third level, students are able to think critically visually. At this level, students successfully solve problems that require criticality and visual intelligence.

VISUALIZATION OF SIMILARITY AMONG REGIONS IN OGAN ILIR REGENCY, SOUTH SUMATERA PROVINCE BASED ON COVID-19 CASE CHARACTERISTICS

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Abstract. This article describes the results of the data analysis of Covid-19 case in Ogan Ilir Distric of South Sumatera Province. There were some visualization graphs of similarity groups among 16 sub-districts based on the Covid-19 case characteristics. Visualization similarity was drawn on biplot graph based on the name of sub-districts and some Covid-19 case characteristics. The implementing social activity restrictions from the government policy was referrenced as a way to split the time periods in analyzing data. The first period was an initial time that the pandemic breakout, the next period was the period of social activities restriction in a large-scale of area in Indonesia, then the new normal period. The biplot graphs showed that there were various grouping of sub-districs in every period of time. There were differences sub-districts grouping from period to period. The variance and the correlation between two of Covid-19 case category was differ from period to period as well. Nevertheless, there were a special noted about some sub-districts that tend to be a solo group separated from the others sub-district groups in some periods,.Those solo group of sub-districs were Indralaya, Indralaya Utara, Pemulutan Selatan, and Sungai Pinang. These results were simple visualization of similarities among sub-districs that could be deeply investigated. Next research could be done by explorating, interpreting, or predicting the Covid-19 data using the different of statistical method.

ANALYSIS OF STUDENTS' COMBINATORIAL THINKING ON MATHEMATICS FORMULA AND COUNTING PROCESS

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Abstract. This study is aimed to analyze students' ability in solving combinatorial problems. Their ability is seen from combinatorial thinking process used in solving problems. For this purpose, this research used a qualitative method with type of analyzing sets of data. Two related areas were investigated regarding to a combinatorial thinking model. How students performed their combinatorial thinking based on Lockwood's model: and how students' ability in formulating and doing counting process when solving problems. Participants of this research were 20 students of mathematics education department who took combinatorics course. Five combinatorial problems were given to students and were analyzed. The result showed that based on Lockwood's model, majority of students tend to solve problems with steps starting from formulating, followed by counting process to set of outcomes or solutions. For most students, the difficulties in formulating problems became a main cause for not knowing how the counting process should be done. However, for several cases, students might jump into counting process by using trial and error strategy but not all of them were able to reach set of outcomes. Data also showed that students' ability in solving combinatorial problems were relatively low.

ACTUAL AND PARTIAL VANDALISM: METACOGNITIVE IMPAIRMENT IN MATHEMATICS PROBLEM-SOLVING

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Abstract. Problem-solving is an important aspect in mathematics education, and this cannot occurs optimally when students only have one knowledge and facts about mathematics. Therefore, students need to have the ability to monitor and organize their knowledge using their metacognition problem-solving skills, which plays an important role in determining the real problem and understanding how to achieve a goal or solution. The purpose of this research is to understand students' metacognitive failure in calculus courses. This qualitative research was carried out in May-June 2021 at the Islamic University of Malang by giving mathematical problems on the Fundamental Theorem of Calculus (FTC). Presently, no research has explored the metacognitive knowledge on the teaching and learning of mathematics at the university level. Data were collected by interviewing students on cases encountered during calculus learning. The data were analyzed using a shortened version of the grounded theory due to time or resource constraints. The purposive sampling method was used to select students due to the lecturers' inability to determine their background and calculus abilities in the first year by using the principle of grounded theory, such as open, axial, and selective coding processes, as well as comparative analysis w. All students enrolled in the calculus course are invited by email, of which three stated that they participated voluntarily and have good communication skills. Two questions about the FTC were used to explore their factual, conceptual, and procedural knowledge. The results showed that there were two types of vandalism, namely actual and partial.

DESCRIBING SOFT SKILLS ATTRIBUTES OF SENIOR HIGH SCHOOL TEACHER IN MATHEMATICS LEARNING

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Abstract. The implementation of education in primary and secondary schools in Indonesia follows the standard process set by the government. One of the learning principles used is to balance physical skills (hard skills) and mental skills (soft skills). Therefore, teachers have an impact in their role to develop students' soft skills. This study aimed to describe the development of soft skills of a teacher in mathematics learning at SMA N Kertosono, Indonesia. The researchers as the main instrument with supporting instruments, observation sheets on the implementation of learning in class, and interview guidelines. The credibility of data by using triangulation methods and data analyzed in-depth to describe the soft skills development of high school mathematics teachers in learning. The results showed that the teacher developed soft skills in mathematics learning: (1) verbal mathematical communication, giving different intonations on the preferred mathematical object, pointing to the mathematical object in question, and marking by circling or boxing the mathematical object described; (2) problem-solving, guiding students with coherent steps to begin to identify the things being asked, looking for possible answers by testing in detail, making complex problem-solving, checking the results of solving problems that have been done and concluding the answers generated; and (3) critical thinking, asking students to be careful, dare to give an assessment of the teacher's work, and dare to express opinions in learning.

DESCRIBING SOFT SKILLS ATTRIBUTES OF SENIOR HIGH SCHOOL TEACHER IN MATHEMATICS LEARNING

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Abstract. The implementation of education in primary and secondary schools in Indonesia follows the standard process set by the government. One of the learning principles used is to balance between physical skills (hard skills) and mental skills (soft skills). Therefore, teachers have an impact in their role to develop students' soft skills. The purpose of this study was to describe the development of soft skills of a teacher in mathematics learning at SMA N Kertosono, Indonesia. The researchers as the main instrument with supporting instruments, observation sheets on the implementation of learning in class and interview guidelines. Credibility of data by using triangulation methods and data analyzed in depth to get a description of the soft skills development of high school mathematics teachers in learning. The results showed that the teacher developed soft skills in mathematics learning: (1) verbal mathematical communication, giving different intonations on the preferred mathematical object, pointing to the mathematical object in question, and marking by circling or boxing the mathematical object described; (2) problem solving, guiding students with coherent steps to begin to identify the things being asked, looking for possible answers by testing in detail, making detailed problem solving, checking the results of solving problems that have been done and concluding the answers generated; and (3) critical thinking, asking students to be careful, dare to give an assessment of the teacher's work, and dare to express opinions in learning.

VERTEX EQUITABLE LABELING FOR ACTINIA GRAPH

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Abstract. Let G be a graph with vertex set $V(G)$, edge set $E(G)$, $|V(G)| = p$, $|E(G)| = q$, and $\mathcal{A} = \left\{0,1,2,\dots,\left\lceil\frac{q}{2}\right\rceil\right\}$. A vertex equitable labeling of G is a labeling $f: V(G) \to \mathcal{A}$ that induces a bijective edge labeling $f^*: E(G) \to \{1,2,\dots,q\}$, defined by $f^*(uv) = f(u) + f(v)$ for every $uv \in E(G)$, such that $\left|v_f(a) - v_f(b)\right| \leq 1, \forall a, b \in \mathcal{A}$, where $v_f(a)$ be the number of vertices v with $f(v) = a$ for $a \in \mathcal{A}$. A graph G is said to be vertex equitable if there exists a vertex equitable labeling. Many authors have studied vertex equitable labeling, and they found many vertex equitable graphs. Many graphs are not known whether they are vertex equitable or not. We need to find some new classes of graphs that are vertex equitable. Let m and n be positive integers. An actinia graph $A(m,n)$ is a unicyclic graph obtained from a cycle C_m, $m \geq 3$, and each vertex of C_m is joined to n new vertices of null graph N_n. In this paper we find that the actinia graph $A(m,n)$ is vertex equitable for every even m.

RME BASED MATHEMATICS WORKSHEETS AS A SOLUTION TO MATHEMATICS LEARNING PROBLEMS DURING THE PANDEMIC

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The purpose of this study was to find solutions to students' difficulties in the learning process of mathematics during the Covid 19 pandemic. This type of research is qualitative research. The research subjects in this study were 3 students in the city of Sukabumi, West Java who were taken by purposive sampling technique. Data collection techniques using documentation and interviews. The data analysis technique used in this research is data reduction, data presentation, verification and conclusion. The results of this study state that the greatest difficulty experienced by students in learning mathematics during the Covid 19 pandemic is that students are not used to independent learning because mathematics is an abstract concept and needs guidance in understanding it. The alternative solution is to use mathematics worksheets based on Realistic Mathematics Education because it can guide students in constructing learning starting from a real context to an abstract context.

COLLABORATIVE MATHEMATICS LEARNING MODEL FOR THE COVID-19 PANDEMIC ERA: Middle School Students' Independent Habituation

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Abstrak
In principle, the goal of this study is to create a collaborative-based model for managing mathematics learning in the Covid-19 pandemic that is efficient at improving learning output. The specific objectives of the research in this article are to describe (1) collaborative-based learning of mathematics during the Covid-19 pandemic era and (2) independent habituation of junior high school students. The type of this study is research and development. It considers a qualitative ethnographic research design. Math teachers, principals, and students from SMP Negeri 1 Colomadu Karanganyar participated as research subjects. The method of data collection was done by conducting observations and field notes, interviews, and documentation. The data analysis technique was done inductively. The results of this study are (1) collaborative-based learning of mathematics during the Covid-19 pandemic era, in the paradigm of "students actively construct meaning - teacher as facilitator, students find concepts - teacher facilitates problem solving". That mindset is a change of reflection and action. The management model is carried out in three stages with five provisions. (2) Making students ready to be independent, requiring teachers to be independent, enabling, and building students' abilities, from before to the time of learning. Independent students were based on a strong religion, core character, lifestyle character, respect for others, and the potential to be intelligent, creative, innovative, and entrepreneurial.

WHAT ARE THE PUPILS' CHALLENGES IN IMPLEMENTING REFLECTIVE THINKING FOR PROBLEM-SOLVING?

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Abstract. Reflective thinking plays a crucial role in problem-solving. However, there are still numerous pupils who are challenging in implementing it. This research discloses what the challenges are. The design research employed is qualitative descriptive research. The invited participants are sixty-two students from ten areas in Indonesia. The validated instruments among test methods, observation sheets, and interview guidelines. Data analysis includes reduction, presentation, and inference. We successfully concluded that challenges exist in aspects of technique, monitoring, insight, and conceptualization. Further research could focus on defragmenting to address challenges in implementing reflective thinking.

THE DEVELOPMENT OF STEM BASED DISCOVERY LEARNING MODULE IN DIFFERENTIAL EQUATIONS: ONE-TO-ONE EVALUATION

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Abstract. Differential Equation is a branch of mathematics that is closely related to the daily life problem. The learning of differential equations is tends to be textbook oriented. Based on the needs analysis in the field, it is necessary to develop a differential equation learning module based on Science, Technology, Engineering, and Mathematics (STEM)-Discovery Learning. The aim of this study is to describe the evaluation result of the STEM Discovery Learning Module though one-to-one evaluation. The research employs a design research by using Plomp development model, involves preliminary investigation, prototyping or developing, and assessment phases. One-to-one evaluation is a step of formative evaluation in prototyping phase. The subjects in this study are three college students of the Mathematics Education Study Program FKIP UMS who had high (S1), moderate (S2), and low (S3) abilities. Data collection techniques uses interviews and documentation. The data validity technique uses source triangulation, and data analysis technique uses the flow method which consists of data reduction, data presentation and drawing conclusions. The research result show that: 1) Module clarity: activity steps in STEM Discovery learning Module is clearly followed by students, the language is clear, communicative, and easily understood, mathematical symbols in module are precise and clear, time allocation for each discovery is sufficient. However, in Discovery I, student found a difficulty in solving the activity. 2) Module performance: module design, color, font have attracted attention, and module presentation was coherent. 3) Obvious error: there are several obvious errors in module, some of links are not clearly, some mathematical symbols writing are inconsistent and not clear, there were question mark at the bottom of the symbols, and there were some sentences underlined in module. Hence, the module revision is needed in order to improve and perfect the prototype, so that it will be ready to be evaluated in the next formative evaluation stages.

APPLICATION OF THE CUBIC SPLINE NONPARAMETRIC REGRESSION MODEL TO HUMAN DEVELOPMENT INDEX DATA IN INDONESIA

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Abstract. The most popular measurement in determining the success of human development is known as the Human Development Index (HDI). The HDI calculation is based on four influencing indicators, namely life expectancy, expected years of schooling, mean years of schooling, and adjusted per capita expenditure. The effect of indicators on HDI can be determined by using a cubic spline nonparametric regression model. Cubic spline regression is used because it can eliminate curves that exceed the limit and the error is large enough to fit the data characteristics. The best cubic spline nonparametric regression model is influenced by the optimal knot point selection. The selection of the optimal knot point is based on the minimum generalized cross validation (GCV) value. In this article, a cubic spline nonparametric regression model is applied to the HDI data in Indonesia. Based on the results, it was obtained that the best cubic spline nonparametric regression model on HDI data in Indonesia with GCV value = 0.003539 and 3 optimal knot points for each independent variable. The results show that indicators of life expectancy, expected years of schooling, mean years of schooling, and adjusted per capita expenditure are indicators that influence HDI in Indonesia.

STUDENT'S CRITICAL THINKING ABILITY ON THE APPLICATION OF THE LINEAR EQUATION SYSTEM THROUGH MODEL PROJECT-BASED LEARNING MATLAB ASSISTED

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Abstract. The low critical thinking ability of students and difficulties in solving algebra problems are the background of this research. The purpose of this study was to describe the effect of using a linear equation system application problem using the learning model Project-Based Learning on students' critical thinking skills assisted by Matlab. The type of research used in this study was pre-experimental, with a one-group pre-test and post-test design. The research subjects were students of STKIP Kusuma Negara which amounted to 28 students with the determination of the sample using the purposive sampling technique. The data collection technique used is the test. The tests used in this study were pre-test and post-test on the application of linear equations system, chemical reaction equations and interpolated polynomials inform essay. The results showed that students with high critical thinking skills met all indicators of critical thinking skills. Students with moderate critical thinking skills cannot meet the inference indicators. Meanwhile, students with low critical thinking skills are less able to interpret problems and cannot fulfill analysis, evaluation, and inference indicators. The post-test results obtained very good results where their test results increased from before, in the final test obtained the number of students who completed 78.57% and students who did not complete 21.43%, with an average score of 81.93.

TOWARDS A GOOD PROBLEM SOLVER THROUGH DECISION MAKING MODEL OF TEACHING: A NEEDS ANALYSIS

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Abstract. Being a good problem solver is a need in life in the present and future era. Therefore, producing prospective mathematics teachers to become problem solvers is essential to teach it to his students later. This study aims to describe the analysis of needs to be a good problem solver through a decision-making-based learning model. This type of research is descriptive qualitative with a research sample of 63 mathematics education students and 13 mathematics education lecturers. The data collections are through questionnaires distributed online and interviews. The research data analysis was carried out by grouping, reducing, describing, and concluding by first testing the validity of the data through triangulation of methods. The results of this study indicate that: (1) there are still many students who have difficulty in finding problem-solving ideas; they are not precise in choosing the right strategy and procedure for solving them so that it results in students not being able to solve mathematical problems well; (2) There are still many lecturers who have not provided opportunities for students to express, clarify and assess their solution ideas so that they can obtain correct problem solving; (3) There is no learning device designed that already explicitly so that students become good problem solvers. The needs analysis results indicate that it is necessary to develop a learning model based on decision-making.

STUDENTS' PERFORMANCE IN SOLVING WORLD PROBLEM: INSIGHT FROM CONNECTION ABILITY

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Abstract. The mathematical connection is one of the essential abilities in the success of students in solving word problems. However, most students still have difficulty in solving word problems. This study aims to investigate student performance in solving word problems insight from the mathematical connections' ability. This qualitative research was conducted at one of Muhammadiyah Junior High Schools in Surakarta for the 2019/2020 academic year with 56 of 7th-grade students. Data were collected using tests and interviews. The subjects were provided three-word problems that represent indicators of mathematical connections. Before being used for research, the problems were validated by two experts. Based on the test results, students are grouped into three categories: high, medium, and low. The results showed that students with high abilities could understand and solve problems related to aspects of the connection between mathematics topics, other disciplines, and the real world or daily life appropriately. Students with moderate ability can understand and solve problems in connecting mathematical topics and mathematics and everyday life. Nevertheless, in doing so, students are still not careful in using the inequality operation mark. Besides, students with low abilities cannot understand and solve problems related to mathematics aspects with other disciplines. In short, most students still have difficulty in solving word problems related to the connection of mathematics with other disciplines. The results suggest the development of word problems that link math topics with other topics outside of mathematics.

GESTURE LEARNING MATHEMATICS, SPONTANEOUS?

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Abstract. Mathematics learning should be designed to introduce learners" power of mathematical meaning to the below to real-world models. Gestures in learning also have a very important role in delivering materials and focusing the attention of students. The gestures of teachers and students that appear during the learning process prove that the body is involved in learning interactions. This study aims to decrypt gestures that are produced spontaneously in mathematical learning. The research was conducted at the elementary and high school levels. The research subjects are teachers and students. Data collection is done by observing /recording audio visually the learning process of mathematics in class, then the collected data is analyzed exploratively with qualitative analysis techniques. The results of research were described into 2 (two) categories, namely the gesture of the teacher delivering the material and the gesture of the students solving mathematical problems. Both show that the gestures produced during the mathematical learning process appeared spontaneously and had meaning integrated with speech.

PROFILE OF STUDENT PROBLEM-SOLVING ABILITY BASED ON ETHNOMATHEMATICS OF NGAWI CULTURE ON GEOMETRY TOPICS

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Abstract. The low ability of students to solve problems is still an obstacle in mathematics education to date. Mathematical problems given to learning should be related to the context of everyday life, including culture known as ethnomathematics. This type of research is descriptive qualitative because it aims to describe the problem-solving abilities of students based on the ethnomathematics of Ngawi culture on the topic of Geometry. This research is a case study with one male and one female subject selected from 23 junior high school students in Ngawi, East Java, Indonesia. Data analysis was performed by reducing, presenting, and drawing conclusions and checking the validity of the data by using triangulation methods. The results showed that there were differences between the abilities of male and female students in solving problems based on the ethnomathematics of Ngawi culture on the topic of Geometry. Male students are better at understanding problems based on Ngawi's ethnomathematics than female students. When planning and solving problems based on the ethnomathematics of Ngawi culture, male students also appear to be more detailed in explaining each step of the solution. Male students can check completion well than female students. From the results of this study, it can be suggested that junior high school mathematics teachers can design ethnomathematics-based problems that are more varied according to the culture of the students' environment.

FORECASTING THE NUMBER OF COVID-19 ACTIVE CASES IN INDONESIA USING THE MULTILAYER PERCEPTRON FEEDFORWARDS NEURAL NETWORKS

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Abstract. COVID-19 was confirmed to first appear in Indonesia on March 2, 2020. Since the beginning of its emergence, the development of the number of COVID-19 cases in Indonesia has continued to increase, until 29 May 2021, there have been 1,809,926 people infected by COVID-19 with the number of active cases as many as 99,690 cases in Indonesia. The active case talks about COVID-19 patients who need medical care and is directly related to hospital capacity. Therefore the prediction of the number of active cases of COVID-19 is a strategic matter to pay attention to. In this study, active cases were predicted using the Multilayer Perceptron (MLP). The data used in this study came from the COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. The data is the number of positive cases, recovered, and deaths of COVID-19 sufferers in 183 countries in the period 10 January 2020 – 29 May 2021. The results found, in testing period 19 September 2020 – 29 May 2021 or 37 weeks, forecasting active case using (7,10,2) MLP architecture with learning rates 0.01 provides the most accurate forecasting results compared to other window width and architectures. The means absolute percentage error (MAPE) is 5.27%, the root means square error (RMSE) is 8849.01, and the means absolute error (MAE) is 5703.59. This research is useful as a reference for the government in preparation for conditioning hospital bed capacity in the next two weeks based on accurate predictions of active cases of COVID-19 in Indonesia.

MATHEMATICAL MODEL FOR A LIQUID HEAT LOSS

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Abstract. This paper studies the cooling of coffee phenomena using a first-order linear ordinary differential equation (ODE). There are two models that we propose to investigate this phenomenon. We solve the models analytically to obtain the evolution of the temperature as a function of time. Some numerical simulations are presented by solving the model numerically using the Euler and Heun methods. Moreover, the numerical simulations will be applied to adjust a constant parameter of proportionality of the model that will be suitable for the primary data collected from self-experimentation. The result from the first model shows that the coffee temperature decreases to 0°C as a stable, steady state. Meanwhile, the second model simulation shows similar behavior towards room temperature, which is also the only equilibrium point. In addition, RMSEs for the Euler and Heun methods are used to examine the accuracy of both techniques, and we conclude that the Heun method gives a better approach than the Euler.

LOGISTIC SMOOTH TRANSITION AUTOREGRESSIVE MODEL PARAMETER ESTIMATION USING GAUSS NEWTON

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Abstract. Time series dataset analysis depends on now days datasets and the previous datasets. The forming process is called as Autoregressive. Time series dataset is possibly become the fluctuating dataset and forms the nonlinear model. The alternative forecasting model for the fluctuating datasets is mentioned as Smooth Transition Autoregressive (STAR). STAR model is defined by its transition function, STAR with logistic transition function is mentioned as Logistic Smooth Transition Autoregressive (LSTAR). LSTAR is a useful model that can be used to model the nonlinear datasets. By following the Autoregressive (AR) process, LSTAR is shaped with series of nonlinearity tests. The estimation of LSTAR parameter using Gauss-Newton method is an algorithm to minimize the sum of squared residue ε. Concept which underlies the technique is the analysis of Taylor's chain that is applied to declare the original nonlinear equation in shape of linear approximation that is begin with minimizing the sum of squared residue using Nonlinear Least Square (NLS). Hence, the general LSTAR model and the parameter estimation using Gauss-Newton are determined.

PRESERVICE PRIMARY TEACHERS' COMMON ERRORS IN SOLVING MATHEMATICS LITERACY PROBLEMS

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Abstract. Understanding the information on the problem presented in the form of pictures is not an easy task for preservice primary teachers to lead to errors. However, preservice primary teachers can also answer correctly if given a mathematical model directly. Preservice primary teachers' errors can be determined using a process point of view in solving mathematical problems. In a qualitative context, this study describes and analyzes the mistakes of preservice primary teachers traced through errors in solving mathematical literacy problems. This research is qualitative research, where analysis is needed to broaden the understanding of the errors that occur when solving mathematical literacy problems. The results showed that preservice primary teachers experienced errors on each indicator in four types of errors when solving mathematical literacy problems. This research found one new type of error, namely carelessness, which is an error with different types of the four types of errors that exist. Further research can be carried out by designing strategies used to improve the ability of preservice primary teachers to solve mathematical literacy problems.

STUDENT ACTIVENESS IN MATHEMATICS LEARNING USING COMICS ON SOCIAL ARITHMETIC TOPICS

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Abstract. Experts have conducted research on the application of comics in various fields of study. The results showed that the use of comics could support student learning. This research was conducted to expand the study of the application of comics in mathematics learning. The purpose of this study was to determine the activeness of students in learning using comics on social arithmetic material. The research subjects were the 7th grade students of SMP Sunan Kalijaga Malang, which amounted to 26 students. The data in the study were collected through student worksheets, student questionnaires, learning activity observation sheets, and student activeness observation sheets. The results showed that in general the activeness of students in learning social arithmetic using comics was classified as good. Students are only less active at the learning stage which requires communication skills. From the results of this study, it is hoped that teachers will use comics to activate junior high school students in learning mathematics.

THE POTENTIAL OF SPATIAL REASONING IN MEDIATING MATHEMATICAL UNDERSTANDING: THE CASE OF NUMBER LINE

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Abstract. Spatial reasoning has been known to have a strong connection to mathematics achievement and the mental mechanism underlying the embodied mathematics. However, how spatial reasoning mediates the process of mathematizing mathematical ideas is still being investigated. Therefore, this article aims to elaborate the use of number line as a spatial tool to promote spatial reasoning and mathematical understanding. The case is discussed from the perspective of the embodied cognition theory and the instrumentation theory. Based on the theories, the idea of the spatialized instrumentation is promoted to explain the nature of spatial reasoning in promoting embodied mathematics learning through spatial learning tools. Under the spatialized instrumentation, it is argued that spatial learning tools, such as number line, can be used to promote meaningful embodied mathematical experiences involving spatial reasoning that potentially foster the development of mathematical understanding. This finding contributes to the effort of spatializing mathematic learning.

RECALLING OLD SOLUTIONS: INTUITIVE THINKING CHARACTERISTICS OF PROSPECTIVE TEACHERS FROM HIGHER EDUCATION

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Abstract. Intuitive thinking is a cognitive process that works with feeling and has a strong belief to decide with the right answer through previous experience. It appears when someone does problem-solving. This research is a qualitative descriptive study that will describe intuitive thinking characteristics consisting of Catalytic Inference, Power of Synthesis, and Common Sense. The participants of this study are two prospective teachers of Primary School Teacher Education Department, Sayyid Ali Rahmatullah State Islamic University in Tulungagung which are previously drawn from the results of the Matching Familiar Figures Test (MFFT). Think Aloud method is applied to collect data. Credibility is carried out after the data has been collected and it is done through time triangulation and source triangulation. The findings indicate that the prospective teachers work on user experience and prior knowledge immediately, spontaneously, and automatically when they seek solutions to problems. In conclusion, prospective teachers have intuitive characteristics, namely Common Sense.

DEVELOPMENT OF LEARNING MEDIA BASED ON GEOGEBRA SOFTWARE ON THE TOPIC OF TRIGONOMETRIC RATIOS

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Abstract. In line with the development of information technology, mathematics learning innovations need to be continuously carried out by teachers and researchers. The topic of trigonometric ratios is one of the difficult math topics for students, so it is necessary to make learning media so that students are easy to learn. This study aims to develop interactive learning media based on Geogebra on the material of trigonometric ratios. The type of research used is research and development (R&D). This learning media development model was developed based on the ADDIE (Analysis, Design, Development, Implementation, Evaluation) development model. The test subjects in this study were grade 10 vocational high school students. Based on the results of trials conducted on the developed media, data obtained from the validation results of media experts with an average of 3.59 and being in the valid category. The results of the student response questionnaire showed that the Geogebra software-based learning media received a positive response with an average score of 3,48 so it was in the practical category to use. The implementation of learning with the help of Geogebra software gets an assessment of 3,46, so it is in the good category. The results of this development research can be utilized by teachers or researchers in the development of mathematics learning on the topic of trigonometric ratios.

DESCRIBING SOFT SKILLS ATTRIBUTES OF SENIOR HIGH SCHOOL TEACHER IN MATHEMATICS LEARNING

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Abstract. The implementation of education in primary and secondary schools in Indonesia follows the standard process set by the government. One of the learning principles used is to balance between physical skills (hard skills) and mental skills (soft skills). Therefore, teachers have an impact in their role to develop students' soft skills. The purpose of this study was to describe the development of soft skills of a teacher in mathematics learning at SMA N Kertosono, Indonesia. The researchers as the main instrument with supporting instruments, observation sheets on the implementation of learning in class and interview guidelines. Credibility of data by using triangulation methods and data analyzed in depth to get a description of the soft skills development of high school mathematics teachers in learning. The results showed that the teacher developed soft skills in mathematics learning: (1) verbal mathematical communication, giving different intonations on the preferred mathematical object, pointing to the mathematical object in question, and marking by circling or boxing the mathematical object described; (2) problem solving, guiding students with coherent steps to begin to identify the things being asked, looking for possible answers by testing in detail, making detailed problem solving, checking the results of solving problems that have been done and concluding the answers generated; and (3) critical thinking, asking students to be careful, dare to give an assessment of the teacher's work, and dare to express opinions in learning.

STUDENT PROBLEM-SOLVING ABILITY IN GEOGEBRA ASSISTED DERIVATIVE APPLICATIONS (MAXIMUM AND MINIMUM)

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Abstract. Students' problem solving skills are still severely lacking, especially in derivative application materials (maximum and minimum). The purpose of this study is to find out how students' problem solving skills in derivative applications (maximum and minimum) are geogebra-assisted. The method used in this study is qualitative research method, with the focus of the research is the problem solving ability of students in derivative applications (maximum and minimum) assisted by geogebra. The subjects in this study were STUDENTS of STKIP Kusuma Negara Jakarta who had attended the course or who were following the calculus I course, namely there were 6 students with purposive sampling techniques. The instrument in this study is the researchers themselves, tests to measure problem solving skills and interview guidelines. Data collection techniques are conducted with interviews, obsrevation and documentation. Data analysis techniques performed with data reduction steps, data display, data interpretation, conclusion drawing/verification. presentation of data The results of the study showed that there is an improvement in student learning outcomes with the existence of mathematical modeling, especially in students with moderate and low problem solving skills, where students have been able to meet four indicators of problem solving, because students still need help in turning problems in problems into mathematical forms. And students with low problem solving skills only meet two problem solving indicators, because students must strive to understand the problems contained in the problem, then need to be directed in order to turn the problem into a form of mathematics.

EVALUATION OF HYBRID ALGORITHMS (CONSTRAINT BASE AND BOUND AND COLLAPSE) IN BUILDING BAYESIAN NETWORKS STRUCTURES

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Abstract. Bayesian Networks (BN) is a simple probabilistic graph model built from Bayes probability theory and graph theory. The probability theory is directly related to the data, while the graph theory is directly related to the form of representation that you want to get. BN is a simple Probabilistic Graphical Model (PGM) built from Bayes probability theory and graph theory. The probability theory is directly related to the data, while the graph theory is directly related to the form of representation that you want to get. BN can provide simple and solid information about opportunity information. Based on its components, BN consists of Bayesian structure (Bs) and Bayesian parameters (Bp). The constraint base (CB) algorithm is an algorithm that combines two approaches, namely the dependency analysis approach and the search and scoring approach. The purpose of this research is to build a BN structure for incomplete data (there is missing value) and to obtain a structure search algorithm that is computationally easy to work and does not require node ordering. The algorithm consists of two phases, namely the first phase is obtained (as part of) the CB algorithm, the result is node ordering. The second phase is designed to study the BN structure from data that has missing values, which is the same as that applied by the Bound and Collapse (BC) algorithm. BN has two algorithms that can work on complete and incomplete databases, namely the hybrid algorithm. Hybrid Algorithm is an algorithm that combines two methods in building structural construction, namely dependency analysis and search and scoring methods. The Hybrid Algorithm can construct structures in the form of graphs and relationships between nodes and display variable probability values based on complete and incomplete database inputs.

CHARACTER EDUCATION IN ONLINE MATHEMATICS LEARNING DURING THE COVID-19 PANDEMIC

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Abstract. Character education is an important thing to be conveyed in all subjects, including mathematics learning. However, the Covid-19 pandemic is a challenge for the world of education, especially formal education in character education efforts. The purpose of this study is to discuss how character education can be implemented in online mathematics learning during the Covid-19 pandemic. This research is descriptive qualitative with a literature study that seeks to provide a solution for how character education is implemented in online mathematics learning during the Covid-19 pandemic. This study then found that character education in online mathematics learning during the Covid-19 pandemic could be implemented by integrating character values in math assignments given by teachers, delivering character values through learning media, and integrating character values in math textbooks or modules.

ELEGANT LABELING OF THE WEB GRAPH WITHOUT CENTER $W_0(2,n)$ AND $W_0(3,n)$

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Abstract. Let G be a finite and simple graph with vertex set $V(G)$,edge set $E(G)$,and number of edges q. An elegant labeling f of G is an injective function from $V(G)$ to the set $\{0, 1, 2, ..., q\}$ such that the induced edge labels, where each $xy \in E(G)$is assigned the label $f^*(xy) = f(x) + f(y)\ (mod(q+1))$, are distinct and non zero. If a graph can be labeled by an elegant labeling, then the graph is said to be elegant. Many authors have studied elegant labeling of graphs and found many elegant graphs.There are many graphs are not known whether they are elegant or not. We need to find some new classes of graphs that are elegant. In this paper we show that for every odd integer n, $n \geq 3$, the web graphs without center $W_0(2,n)$ and $W_0(3,n)$ are elegant.

THE EFFECT OF INQUIRY LEARNING MODEL AND SCIENTIFIC ATTITUDES ON DIVERGENT THINKING ABILITY IN THE ENVIRONMENTAL EDUCATION COURSE

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Abstract. This study aimed to discover the effects of the instruction model and scientific attitude toward environment education divergent thinking. The study adopted is the experimental method, while the design used is factorial 2 x 2 (factorial post-test only design). The research was conducted in STKIP Sebelas April Sumedang. The population participated in this study college student STKIP Sebelas April Sumedang during the odd semester of the 2020/2021 academic years. Samples were selected by using a simple random sample totalling 74 people. The study result conducted showed that the use of the inquiry model and scientific attitude provided a good effect on the students' Environment education divergent thinking.

CLUSTERING AND MAPPING OF DHF IN WEST JAVA WITH PURELY SPATIAL SCAN STATISTIC ANALYSIS USING DISCRETE POISSON MODEL

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Abstract. DHF (Dengue Hemorrhagic Fever) is one of the epidemiological diseases that contagious, can cause death in a short period of time, and frequently causes an outbreak. The disease is transmitted by Aedes aegypti and Aedes albopictus mosquitos. Except in places with altitudes of more than 1,000 meters above sea level, both types of mosquitos are found in tropical and subtropical regions of the Indonesian archipelago to northern Australia. In 2016, West Java Province had the highest DHF in Indonesia. Epidemiology is the science that studies the distribution, frequency, and determinants of a disease in order to solve health problems. To deal with DHF issues, map and cluster the dengue fever to determine which spreading and locations are at high risk for DHF. In this research, clustering and mapping of dengue disease in West Java in 2016 were analyzed using purely spatial scan statistic using the discrete Poisson model. Clustering analysis was used to identify high-risk DHF sites and to map the spread of DHF. Based on the research, it can be concluded that West Java Province has 17 clusters of DHF disease. The radius of the largest cluster is 47.14 km. The most DHF patients are found in Bandung City and Cimahi City clusters, with a total of 4,565 people.

SUBJECT SPECIFIC PEDAGOGIC: PROBLEM SOLVING SKILL AND CHARACTER PRE TEACHER MATHEMATICS IN INDONESIA

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Abstract. The main objective in this research is to learn how to solve students' problems and characters based on the Subject-Based Pedagogic (SSP) Statistics based on the character-loaded Heuristic Strategy developed. This discussion is a synergy of previous research as a new discussion which is the conception of development in achieving optimal problem solving and character. The method used is the final research and development with an experimental form. The instrument used was a test of problem solving abilities, questionnaires, character assessment, and assessment sheets, the results of the study were analyzed descriptive and inferential with logical and analytic reasoning. Based on the results obtained that the heuristic strategy through the collection of identification, planning, doing and checking is an alternative mathematical learning solution that is very powerful and potential in integrating characters as a learning scheme to be able to improve problem solving skills and develop students' character in containing the SSP. Significant differences occur in the problem solving process and the character of prospective students in Indonesia for those who use the SSP and those who do not. The SSP was improved with classical completeness by 95%.

KRIGING WITH SEMIVARIOGRAM-COPULA GUMBEL TO PREDICT THE INCIDENCE OF COVID-19 POSITIVE CASE IN DKI JAKARTA INDONESIA

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Abstrak. Coronavirus disease 2019 (Covid-19) caused by the SarsCoV-2 virus has been a new type of disease since the end of 2019. The number of Covid-19 cases has increased every day worldwide and has been declared a global pandemic by WHO. DKI Jakarta is the first province in Indonesia to have confirmed positive cases of Covid-19 in March 2020. The addition of positive cases in DKI Jakarta is still the highest until October 2020. Predicting the number of additional positive cases in an area can be done using the Kriging method. Kriging requires a variogram in its calculations. The Gaussian assumption in the variogram is almost unfulfilled for environmental processes but copula can be used by generalizing the concept of the variogram. Therefore, the addition of positive cases of Covid-19 can be predicted by the Kriging method with a semivariogram copula. The purpose of this study was to apply the Kriging method with semivariogram copula to data on the addition of positive cases of Covid-19 in DKI Jakarta. This study uses coordinate data from 44 sub-districts in DKI Jakarta and data on the daily addition of positive cases of Covid-19 from March to October 2020 in DKI Jakarta. The copula used to model the semivariogram copula is the Gumbel copula. Based on the research, the Gumbel copula semivariogram model was obtained for data on the average daily addition of positive Covid-19 cases in DKI Jakarta. The universal Kriging method is used because the data has a trend. The root mean square error value in the Gumbel copula is 2.4568.

ANALYSIS OF STUDENT DIFFICULTIES IN COMPLETING SOCIAL ARITHMETIC STORIES ASSESSED FROM UNDERSTANDING THE CONCEPT

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Abstract. Social arithmetic is a mathematical subject that studies social life, such as buying and selling activities. Social arithmetic problems are generally given in the form of story questions and require more understanding of concepts. Some students may have difficulties solving social arithmetic issues. This study aims to analyze student difficulties on social arithmetic problems based on conceptual understanding. Indicators of the concept understanding on this study are (1) restatement of the concept; (2) classifying objects based on the required form of the concept; (3) provide an example or non-example of the concept; (4) related to various concepts; (5) concluded. The type of this research is descriptive qualitative research with a case study. The subject in this study are students from class VII at Muhammadiyah Junior High School Kartasura, Central Java. Methods of data collection used tests and interviews. Data analysis through data reduction, data presentation, and conclusion. The validity data used the triangulation method to ensure the continuity of the data. This study showed a result of this study showed that students with low ability difficulty in indicators 2, 3, 4, and 5. Students with medium ability difficulty in indicators 4 and 5. Students with high ability would have trouble in indicator 5. The student difficulties occur because they do not understand the story questions, less thorough in answering questions, less practice, and rarely study, so they forget the material.

USING R LANGUAGE IN TEACHING STATISTICS]

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Abstract. Administrations Statistics have a significant job in research; hence, Managements Statistics should be dominated well by understudies. Administrations Statistics learning dependent on ICT needed to develop further. In light of perceptions tracked down that the PC as mindtools in insights has not been utilized. Using applications is the best way to understand all statistical concepts. One of the applications that can be used is the R language. R is the free version which can help in processing data, presenting data in graphical form, and analyzing data. This examination is meant to foster an incorporated administration insights coursebook with R language that can work on learning Managements Statistics. The plan research technique was embraced in this investigation. The course reading was created with the Plomp model and alluded to Tessmer's developmental assessment. The discoveries show that the course reading is legitimate, practice, and compelling from the substance and build angles. Test aftereffects of post-test altogether affect a pre-test. The viability of utilizing the reading material is seen by a standardized increase computation, which got a standardized addition worth of 0.69. It implies the course reading grew adequately in further developing learning results for understudies.

INTEGRATED MANAGEMENT STATISTICS TEXTBOOKS WITH R LANGUAGE

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ABSTRACT

Administrations Statistics have a significant job in research. Accordingly, Managements Statistics should be dominated well by understudies. Administrations Statistics is learning dependent on ICT needed to develop it further and in light of perceptions tracked down that the PC as mindtools in measurements has not been utilized. Utilizing applications is the ideal approach to see every measurable idea. One of the applications that can be used is the R language. R is the free form that can assist with preparing information, present information in graphical structure, and examine reports. This investigation is expected to foster a coordinated administration insights coursebook with R language that can work on the adequacy of learning Managements Statistics. The plan research technique was embraced in this investigation—the coursebook created with the Plomp model and alluded to Tessmer's developmental assessment. The discoveries show that the coursebook is legitimate from the substance and builds viewpoints.

COMPARING VIRTUAL AND CONCRETE MANIPULATIVES ON 5TH GRADES STUDENTS IN FRACTION PERFORMANCE

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Abstract. The purpose of this study was to investigate the rule of virtual and concrete manipulatives to mathematics abilities in fractions on 5th[th] Grade students regarding self-regulated learning. This research was conducted in Jakarta, Indonesia. This study used a quasi-experimental design. The experimental group learned mathematics using virtual manipulatives and control group using concrete manipulative. The 5th[th] Grade students' performance of fraction was taken by written tests and analyzed by two-way ANAVA. The results shown that students' fractions performance using virtual manipulatives were better than concrete manipulatives and there was an interaction between learning media and self-regulated learning to mathematical abilities. Also results found that students with high self-regulated learning have higher fraction performance if they are learnt by visual manipulatives. In the other hand, students with low self-regulated learning get higher achievement if they were learnt by concrete manipulative. This study suggests that virtual manipulatives can be used as proper learning tools for Elementary school students to understand fractions but can be used to another mathematics domain.

Surakarta, 11 Agustus 2021

Ketua Panitia

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