Book of Abstract

"The 1st International Webinar on Mathematics, Natural Sciences and Learning In The New Normal Order"

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OPENING SPEECH
RECTOR OF UNIVERSITAS NEGERI MANADO
Prof. Dr. Deitje Adolfien Katuuk, M.Pd

SHALOM; ASS.WR.WB; OM SWASTYASTU; NAMO BUDHAYA; SALAM KEBAJIKAN.
GOOD MORNING EVERYBODY,

THE CHAIRMAN OF MIPA LPTK ASSOCIATION OF INDONESIA, DEAREST DOCTOR. YULKIFLY AMIR, M.SI.
DEAR DEANS OF FACULTY OF MATHEMATICS AND NATURAL SCIENCES AND OF THE FACULTY OF MATHEMATICS AND NATURAL SCIENCES EDUCATION OF LPTK FROM ACROSS INDONESIA COUNTRY.
DISTINGUISHED SPEAKERS:
DOCTOR. AGUSTINUS R. URIA, M.SC OF HOKKAIDO UNIVERSITY OF JAPAN. PROFESSOR. DR. M.V. REDDY OF THE INSTITUTE OF
RESEARCH HYDRO-QUEBEC - CANADA,
PROFESSOR. GIUSEPPE DI FAZIO FROM THE UNIVERSITY OF CATANIA, ITALY DRA. VANNY M.A. TIWOW, MSC, PHD
OF VALAYA ALONGKORN RAJABATH UNIVERSITY OF THAILAND;
MR. HENDRY IZAAC ELIM, PHD. UNIVERSITAS PATTIMURA INDONESIA

INVITED SPEAKERS FROM MIPA-LPTK ACROSS INDONESIA UNIVERSITIES
THE DEAN OF FMIPA UNIMA; DR ANETHA TILAAR, MSI, ALL MEMBERS OF THE ORGANIZING COMMITTEE, DEAR LECTURERS, EDUCATORS AND STUDENTS, AND ALL PARTICIPANTS OF THIS WEBINAR INTERNATIONAL CONFERENCE.

DISTINGUISHES LADIES AND GENTLEMEN,
FIRST OF ALL, THANKS AND PRAISED TO ALMIGHTY GOD FOR THE GOOD-HEALTH AND THE TIME, OPPORTUNITY GIVEN TO ALL OF US, TO CARRY OUT AND TO PARTICIPATE IN THIS WEBINAR WITH A TITLE: ***"INTERNATIONAL WEBINAR ON***

MATHEMATICS, NATURAL SCIENCES, AND LEARNING IN THE NEW NORMAL ORDER".

ALL OF US, I SAY IT AS ACTIVISTS IN THE WORLD OF EDUCATION, NOT ONLY IN INDONESIA, BUT SPREAD GLOBALLY ALL OVER THE WORLD, ARE FACING TOGETHER THE **DISRUPTION** IN ALMOST ALL ASPECTS OF HUMAN BEINGS, INCLUDED IN THE FIELD OF EDUCATION, BECAUSE OF THE COVID-19 PANDEMIC. THE TIME IS MOVING VERY FAST AND MANY THINGS IN OUR LIFE AND JOB ARE CHANGING. THE CHALLENGE THAT WE ARE FACING NOW AND IN THE FUTURE WORLD IS THAT THE UNCERTAINTY. THERE ARE MANY KINDS OF THINGS IN OUR SOCIAL LIFE INCLUDING IN EDUCATION UNEXPECTEDLY OCCURRED; THERE ARE ACTIVITIES IN SCHOOL, CAMPUSES, EVEN IN OUR CULTURE HAVE CHANGED. FOR INSTANCE, A MOTHER POST THE STATUS ON HER FB: "***DULU ANAK-ANAK KE SEKOLAH DILARANG BAWA HP, SEKARANG ANAK DILARANG KE SEKOLAH TAPI BELAJAR DI HP SAJA***".

LADIES AND GENTLEMEN,

ALL OF THOSE DISRUPTIONS NOT ONLY BRINGS ABOUT TROUBLE OR DISORDER BUT ALSO CREATES "BREAKTHROUGHS" IN THE HUMANKIND AND CULTURE. WAYS IN DOING OUR TEACHING AND LEARNING, IN BUSINESSES, IN SOCIAL INTERACTION ACTIVITIES HAVE BEEN 'CHANGING'. WE NOW EXPERIENCING THE LIVE IN DIFFERENT BUT CHALLENGING WORLD, AND I GUESS, MAYBE THAT IT IS THE REASON WHY THIS INTERNATIONAL WEBINAR CONFERENCE CHOOSES THE THEME OF WEBINAR ON MATHEMATICS, NATURAL SCIENCES, AND LEARNING IN THE NEW NORMAL ORDER.

LEARNING, TEACHING, RESEARCHING IN NEW ORDER IS STILL NEW TO ALL OF US, THEREFORE, BY THIS WEBINAR, EXPECTATIONS ABOUT PROBLEMS ABOUT THE NEW NORMAL THINGS RELATE TO MATHEMATICS, NATURAL SCIENCES AND IN LEARNING COULD BE DISCUSSED AND HOPEFULLY WILL CREATES AND PRODUCE SOLUTIONS NEEDED.

LADIES AND GENTLEMEN,

THIS WEBINAR SUPPORTS THE ENHANCEMENT AND ACHIEVEMENT IN THE PUBLICATION OF SCIENTIFIC RESEARCH AND WORKS THAT IS NEEDED IN HIGHER EDUCATION, SINCE WE ALL KNOW THAT SCIENTIFIC PUBLICATION IS ONE OF

IMPORTANT INDICATOR IN ASSESSMENT OF THE QUALITY OF SERVICE OF A UNIVERSITY, ESPECIALLY IN THE ISSUES OF ACREDITATION AND CERTICATION OF THE INSTITUTION.

MORE OVER, AS THE RECTOR OF UNIVERSITAS NEGERI MANADO, I WOULD LIKE TO WELCOME TO ALL OF THE DISTINGUISED SPEAKERS AND INVITED SPEAKERS AND THANK YOU FOR THE CONTRIBUTION AND PARTICIPATION ON THE WEBINAR. ALSO, WELCOME AND THANKYOU VERY MUCH TO ALL OF YOU, LECTURERS RESEARCHER, TEACHERS, STUDENTS, ALL PARTICIPANTS. I APPRECIATE YOUR WORK, PROUD OF YOU ALL MEMBERS OF THE ORGANIZING COMMITTEE, THANKYOU.
MAY THIS WEBINAR BE SUCCESSFUL, ALL THE PRESENTATION WILL BROADEN AND DEEPEN OUR INSIGHTS TOWARD MATHS, SCIENCE AND LEARNING.
LAST BUT NOT LEAST,
BY SAYING THANKS TO ALMIGHTY GOD, I DECLARE THAT “THE INTERNATIONAL WEBINAR OF MATHEMATICS, NATURAL SCIECES AND LEARNING” IS OPEN.

ENJOY YOUR WEBINAR, THANK YOU ALL
GOD BLESS, WASSALAM, OM SANTI SANTI OM.

WELCOME SPEECH
CHAIRMAN OF MIPA LPTK ASSOCIATION OF INDONESIA
Dr. Yulkifli, S.Pd., M.Si.

Honorable Rector of Universitas Negeri Manado,
Honorable Vice-Rector of Universitas Negeri Manado,
Dean of Faculty, Mathematics and Natural Science
Vice Dean of Faculty, Mathematics and Natural Science
Head of Graduate Program in Faculty of Mathematics and Natural Science
Head of Department in Faculty of Mathematics and Natural Science
Distinguished Keynote speakers and Invited Speakers
Organizers of this conference
Dear participants
Ladies and gentlemen

Assalamualaikum w.w,

Good Morning, first of all I would like to thank God Allah SWT who has been giving us blessing and mercies so we can join this International Webinar in a good condition. Sholawat and salam are always given to our Prophet Muhammad SAW who has taught their people respectively in order to attain happy and prosperous life in this world and here after.

I am delighted to have this opportunity to welcome you in the International Webinar of Mathematics, Natural Science and Learning In The New Normal Order (IWMANSELEN) 2020 which is hosted by Faculty of Mathematics and Natural Science Universitas Negeri Manado and supported by Asosiasi MIPA LPTK Indonesia (AMLI). We are especially honored by the presence of the eminent keynote speakers, who have graciously accepted our invitation to be plenary Speakers.

1. Dr. rer.nat. Agustinus R. Uria, M.Sc from Hokkaido University, Japan
2. Prof. Dr. M.V. Reddy, from Institute of Research Hydro-Quebec, Canada
3. Prof. Giuseppe di Fazio, from University of Catania, Italy
4. Dra. Vanny M.A Tiwow, M.Sc, Ph.D, from Valaya Alongkorn Rajabath University, Thailand
5. Dr. Anetha L.F. Tilaar, M.Si, as Dean of FMIPA Universitas Negeri Manado, Indonesia
6. Hendry Izaac Elim, S.Si, M.Si, Ph.D, from Universitas Pattimura, Indonesia

To all speakers and participants, I am greatly honored and pleased to welcome you this International Webinar event. Even though in the covid 19 pandemic, this international conference event can still be held online with the help and cooperation of the committee.

This conference is a special occasion for those who work in mathematics, natural science, and other related fields. It will be an occasion to meet, to share information, to exchange new ideas and application experiences, and to find partners for future colaboration. Hopefully, this International Webinar will contribute for innovation and trend in mathematics and natural science also other related fields in science and technology for global challenges in Industrial Revolution 4.0.

In closing, I wish the participants a very fruitful and productive meeting. I would like to express my gratitude to all sponsors for their full support and contribution to the IWMANSELEN

2020. I also wish to express my gratitude to the Organizing Committee and the Scientific Committee for their diligence and hard work in realizing this international Webinar in this pandemic.

Finally, we respectfully request the Rector of Universitas Negeri Manado to open the IWMANSELEN 2020

Thank you,

CLOSING SPEECH OF IWMANSELEN 2020
DEAN OF FMIPA UNIMA
Dr. Anetha A.L. Tilaar, M.Si

Good afternoon ladies and gentleman.

Rector of Universitas Negeri Manado, dearest Prof. Dr. Deitje Adolfien Katuuk, M.Pd;
Head of Association of MIPA LPTK Indonesia, Dr. Yulkifly Amir, M.Si;
Dear Deans of Faculty of Mathematics and Natural Sciences of LPTK from across Indonesia country;
All the keynotes and invited speakers;
The committee and all the webinar participants.

Ladies and gentleman, we hope that the presentations today can expand our knowledge in doing our studies, research and community service in new normal era. Thank you very much to all of you.

By saying to God, I close "**The International Conference - Webinar On Mathematics, Natural Sciences and Learning in the New Normal Order (IWMANSELEN) 2020, OCTOBER, 15-th 2020**".

Shalom; Wassalam; Om Santi Santi Santi Om; Sadhu Sadhu; Salam Kebajikan; God bless you.

CONTENT

BIOLOGY

[ABS-24]
A Review on Arbuscular Mycorrhizal Fungal Communities in Response to Disturbance

Andin Vita Amalia[a], Novi Ratna Dewi[a], Andhina Putri Heriyanti[a], Fitri Daeni[b],

Rifa Atunnisa[a,]*

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Abstract

Disturbance, both natural and anthropogenic, is considered a major structuring force in communities and influences overall species. Arbuscular mycorrhizal (AM), a symbiosis between plants and members of Glomeromycota fungi, enhances water and nutrient supply. These fungi play a significant role in the establishment and resilience of vegetation. Understanding arbuscular mycorrhizal (AM) fungus response to disturbance is necessary to preserve and rehabilitate functional plant communities in a post-disturbance landscape. The methods used in this study is a literature review. Firstly, the researcher determines the scope definition of the disturbance type used in the study. The next step is to find a research study that describes the community response, such as the diversity and community changes of AM fungi. The researcher then analyzes the response in different types of disturbances and makes synthesizes of AM fungal diversity and community structure responses. In some studies, soil disturbance reduces AM fungal diversity, spore density, and changes or unchanged in community composition. These findings indicated various responses to disturbance in diversity and community structure.

Keywords: Arbuscular mycorrhizal fungi- Disturbance- Community structure- Diversity

[ABS-40]
THE POTENCY OF CURCUMIN AND THYROXINE HORMONE TO SUPPORT THE ANTIOXIDANT ACTIVITY DURING REPRODUCTION IN COMMON CARP (Cyprinus carpio)

Livana Dethris Rawung[1,], Debby J. J Rayer[1], Nonny Manampiring[1]*

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Abstract

In oviparous animals when the period of reproduction occurs, the activities of metabolism became higher. Naturally, activities of metabolism can produce free radicals. Insufficient antioxidant endogen to scavenge the presence of free radicals can reduce the activities of physiology. The concentration of serum glutamic pyruvic transaminase (SGPT), serum glutamic oxaloacetic transaminase (SGOT), and malondialdehide (MDA) can be the indicator of the production of free radicals. The aim of this study is to know the potency of curcumin and the thyroxine hormone supplementation supporting the antioxidant activity. Our study uses female broodstock of common carp as the experimental animal. In this study, we use forty female broodstock divided into 8 groups of treatments. The result showed that supplementation of curcumin and thyroxine hormone during the reproduction period have potency to support antioxidant activity indicated by the reduction of SGOT, SGPT, and MDA in serum.

Keywords: curcumin, thyroxine hormone, SGPT,SGOT,MDA,Cyprinus carpio

[ABS-53]
Identification of Growth Hormone (GH) gene and Its Association with body weight and body size of Local Pigs from North Sulawesi

Nonny Manampiring, Aser Yalindua, Christny Rompas, Livana Rawung, Yermia Mokosuli, Revolson Mege

Universitas Negeri Manado

Abstract

Growth and development are controlled by growth hormone (GH) gene. GH has a role in the growth and development of children from the embryonic to growth and development after birth. This research was conducted to study the expression of GH gene in the Local pigs from North Sulawesi and its association with body weight and body size. At the ages of 10 to 12 months, a total of 8 local pigs from North Sulawesi were selected for measurement of GH gene expression in the pituitary. The parameters measured were GH mRNA expression, body weight, and body size of local pigs from North Sulawesi. Messenger ribonucleic acid (mRNA) was extracted from pituitary tissue to observe differences in GH gene expression of piglets using real time quantitative Reverse Transcription-Polymerase Chain Reaction (qRT-PCR), with &#946--actin as a housekeeping gene. The results showed that GH mRNA expression was correlated ($P < 0.05$) with body weight and body size of local pigs from North Sulawesi. GH gene expression has an important role in the process of growth and development of local pigs in North Sulawesi, therefore GH has been used as a candidate gene for traits related to livestock production.

Keywords: Local pigs- qRT-PCR- gene expression- growth hormone gene- pituitary

[ABS-54]
Identification by 16S Ribosomal RNA Gene Sequencing of Lactic Acid Bacteria Producing Antibacterial Agents From Langsat Fruit (Lansium domesticum) In Minahasa, North Sulawesi

Helen Joan Lawalata, Mariana Rengkuan, and Utari Satiman

Universitas Negeri Manado

Abstract

Fourty two strains Lactic Acid Bacteria (LAB) were isolated from Langsat fruit (Lansium domesticum) samples obtained from 4 districts in Minahasa, North Sulawesi. Lactic acid bacteria have the ability to inhibit the growth of pathogenic bacteria and putrefactive bacteria. The aim of this study was to identify LAB isolates producing antibacterial agents by 16S Ribosomal RNA gene sequencing. Screening for inhibition of strains were performed with well diffusion method. Four Isolates (LMT2,LMS8, LMI7 and LMU2) had a great ability to inhibit the growth of pathogenic bacteria and putrefactive bacteria. The 16S ribosomal RNA gene from four isolates could be amplified by PCR (Polymerase Chain Reaction) and show a single band on a 2 % (w/v) agarose gel. Identification by 16S Ribosomal RNA gene showed that four isolates LAB producing antibacterial agents were identified as Lactobacillus plantarum with a similarity index of approximately 99-100%

Keywords: Lactic Acid Bacteria, Antibacterial Agents, Langsat Fruit

[ABS-55]
Physico-Chemical Exploration of Yam Flour (Dioscorea Alata L.) as a Raw Material for Processed Cookies

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Abstract

Yam (Dioscorea alata L.) is a vine and twisted stems plant, which are easily wrapped around poles. Yam is a perennial tuber plant grown as an annual plant. Yam contains carbohydrates with low levels of sugar, amylose, minerals, fat, protein and fiber. This research objective was to explore the psycho-chemistry of white uwi and purple uwi as raw material for processed cakes. Fourteen accessions of yam, consisting of 7 accessions of white yam and 7 accessions of purple uwi are obtained from a previous personal collection from community gardens in 2009 located in Banggai Islands Regency, Central Sulawesi Province. The determination of carbohydrate content was carried out by hydrolysis method, amylose content by iodometry, moisture content was measured by oven drying method, ash content was obtained by using dry ashes method, fat content measured using Soxhlet method and crude fiber content using Gravimetric method. The results show that purple yam psycho-chemical exploration was higher on average than white yam, except for the protein in white yam (6.96%) slightly higher than purple yam (6.57%). Purple yam contains the highest water content (10.6%) while white yam has the lowest (7.42 %). The carbohydrate content of purple yam was 79.4% which was higher than white yam (73.41%). Furthermore, the level amylose content of purple yam was on average (9.05%) higher than white yam (6.93%). The total sugar content of purple yam was 0.75% higher than white yam (0.57%). The ash content was relatively the same between purple yam and white yam (2.35% and 2.25%, respectively). The fat content of purple yam is slightly higher than white yam (0.28% and 0.19%, respectively). In terms of protein content, purple yam was lower than white yam (6.57% and 6.96%, respectively). The crude fiber content of purple yam is 1.83% which is higher than white yam (1.11%).

Keywords: accession, D. alata, exploration, psycho-chemistry.

[ABS-60]
ANALYSIS OF TOTAL CHLOROPHYLL OF WHEAT (TRITICUM AESTIVUM L.) SELAYAR VARIETY GIVEN INORGANIC MATTER N, P, AND K

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Abstract

The chlorophyll content is an essential element in the application of inorganic materials in plants. This research aimed to analyze the total chlorophyll of wheat (Triticum aestivum L.) Selayar variety, which was given inorganic N, P, and K. This research was a pot experiment which was carried out through a one-factor treatment design using a Completely Randomized Design. The treatment factors were the fertilizer dosage used NPK 0 mL (control) , NPK 100 mL, NPK 200 mL, NPK 300 mL, and NPK 400 mL. The results showed that the highest total chlorophyll content was in wheat with NPK inorganic material of 23 units of chlorophyll. The highest total chlorophyll content was in the leaves at the top of 22.2 units.

Keywords: wheat, total chlorophyll analysis, inorganic N, P, K.

[ABS-65]
THE EFFECTIVENESS OF THE APPLICATION OF THE GROUP INVESTIGATION MODEL (GI) PEER TUTORING METHODS USING E-LEARNING VIA ONLINE ONLINE AND OFFLINE IN IMPROVING THE RESULTS OF STUDYING SCIENCE AT THE VIIIA CLASS STUDENT HIGH SCHOOL AT EAST MONGONDOW NATIONAL JUNIOR HIGH SCHOOL

Anjelina Maatita[1], Arrijani[1], Aser Yalindua[1]

[1]Universitas Negeri Manado

Abstract

The study model of the group investigation (GI) of peer tutoring metods using e-learning online and offline is an effective learning model to be used during the pandemic of the covid-19 (corona virus diseases-19). Research aims to see the effectiveness of the use of the GI model peer method using e-learning online and offline to improve learning. The method used was one group precursor posttest design experiment. The sample in this study is a VIIIA class with a total of 35 apprenicians. Data obtained from pretests and posttests based on statistical analyses then followed by testing of test-t hypothesis using a separated variant t_(count)= 89,55 and price t_(table)with a=0,05 and degress of freedom = (35+35-2)=68 is 1,30. Since t_(count)> t_(table)(89,55 > 1,30) it can be concluded that H_0 was rejected, this means that there is an average level difference in the ability of science studies between students who study using the educational method of group investigation e-learning online and offline tutors with students who learn to use conventional learning at country second middle school.

Keywords: group study; model age; e-learning method; online and offline

[ABS-66]

Project Bassed Learning (PjBL) study Based on realia media for student learning outcomes on the classification material of the living things in SMA Negeri 3 Tondano

Sesi K.Nukak, Debby J. J. Rayer, dan Alfons A. Maramis

Universitas Negeri Manado

Abstract

The purpose of this study was to see student learning outcomes using the Project Bassed Learning (PjBL) learning model combined with realia media towards student creativity and interest in the classification of living things in SMA Negeri 3 Tonadno. The form of research used is a quasi-experimental research design with the non equivalent pretest-posttest control group design. The research subjects were students of class X MIPA III and X MIPA IV totaling 52 students in total. The instrument used was a rubric of creativity, interest in learning questionnaires, and multiple choice questions. The creativity rubric was used by the researcher to assess the creativity during the learning process through the students^ creativity indicators, namely fluency, flexibility, authenticity and detail. Students ^interest in learning questionnaires were filled in by students to assess the extent of students^ interest in learning and were given multiple choice questions that were used to measure student learning outcomes whether they experienced different levels of value in the control and experimental classes. The results showed that there was an increase in learning outcomes in the experimental class for pre-test 8.00 and for post-test 10.84 with student creativity in working on realia media (herbarium) where the assessment was based on four 75% fluency indicators with good categories, 60% flexibility with sufficient categories, Originality 88% with very good category and 66% elaboration with good category. Creativity also assesses the Practical Report for Making Media Realia (herbarium) based on four fluency indicators reaching 70% in the good category, 83% flexibility in the very good category, 72% originality in the good category and up to 85% in the very good category.

Keywords: Keywords: Learning Outcomes, Creativity, Interest in Learning, PjBL

[ABS-67]
ORGANOLEPTIC PANELIST PERSEPTIONS on THE UTILISATION OF PANGIUM (Pangium edule Reinw) SEED EXTRACT as a POTENTIAL NATURAL PRESERVATIF on MUJAIR (Oreochromis mossambicus) during STORAGE

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Abstract

Mujair (Oreochromis mossambicus) is a freshwater fish popular amongst Indonesian fish consumers due to its affordable economical value and easiness to breed. As a major source of protein, mujair is very perishable and vulnerable to spoilage. Therefore, the seeds of Pangium edule was explored as a potential natural preservative. The seeds of Pangium edule is rich with tannin, natural polyphenols, vitamin C, various antioxidants, iron, β-carotene and flavonoids, which gives the Pangium seed its various functional properties such as anticancer and amongst them its antibacterial capacity. The purpose of this research is to observe the quality changes of the gills, eyes, texture, flesh and odor of mujair previously marinated in 0%, 5% and 10% Pangium seed extracts in 4 days of shelf-life. Organoleptically, the 20 panelist in this study expressed their preferences towards the quality changes of mujair during the 4 days of shelf-life. 2 days of storage with 10% Pangium seed extract was the chosen preference of the panelist, while 4 days of storage all parameters of quality change were rendered undesirable to the panelists.

Keywords: pangium seed, mujair, organoleptic, natural preservatif

[ABS-75]
BIOCHEMICAL CHARACTERISTICS AND ANTIBIOTIC RESISTANCE OF BACTERIAL ISOLATE FROM Ctenocephalides felis

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[2]Departement of Biology, Faculty of Mathematics and Natural Science, State University of Manado, Tondano, North Sulawesi, Indonesia.

Abstract

Cats are the most domesticated animals kept by humans in the world. Cat fleas are ectoparasites that have the potential to transmit disease caused by microbes in humans. Biochemical identification research and antibiotic resistance tests have been carried out against bacterial isolates from cat fleas. Cat fleas were isolated from cats in Manado City, North Sulawesi, Indonesia. Isolation of bacteria was conducted using the scratch method on nutrient agar media. The pure bacterial culture is then used for biochemical analysis and antibiotic resistance testing. Biochemical analysis and resistance tests were performed using the Vitec 2 Compact instrument with a standardized automatic analysis model. The results obtained three species of bacteria from cat fleas based on biochemical identification, namely S. equorum, C. freundii, and Pantoea spp. Antibiotic resistance test on S. equorum showed that of the 60 types of antibiotics used, 55 were sensitive and 7 were resistant. Furthermore, C. freundii, of the 18 types of drugs, 7 were sensitive and 11 were resistant. Meanwhile, in Pantoea spp., Sensitive and resistant drugs were not found. However, the results of this study prove that bacteria from cat fleas have the potential to infect humans with relatively high antibiotic resistance.

Keywords: resistance, antibiotics, biochemical identification, cat fleas

[ABS-76]

The use of local Minahasa isolate fruit flies as learning media for genetic concepts with students^ independent experimental approaches.

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Abstract

Concepts and theories in biology were born out of experimentation. Scientific-based learning emphasizes the experimental process as a learning experience. However, the limitations of tools and materials in schools cause experiment-based learning activities to be rarely carried out by biology teachers. This research was conducted to improve student learning outcomes in the concept of genetics. This research was conducted using the classroom action method. The results showed that in cycle I classical student learning outcomes reached 40% (not yet complete) so that the researchers continued the research to cycle II, classically student learning outcomes reached 88% (learning outcomes increased). Using the audio-visual media method in experimental activities can improve student learning outcomes compared to using conventional learning or lecture methods in class XII SMA Negeri 1 Ratahan.

Keywords: Audio Visual Media, Learning Outcomes, Drosophila sp., Experiment

CHEMISTRY

[ABS-1]
Synthesis and characterization of Schiff's base-based chemosensor for Fluoride ions detection purposes

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[1]Chemistry Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang, Indonesia
[2]Faculty of Applied Science, Universiti Teknologi Mara, Malaysia

Abstract

The development of selective and sensitive chemical sensors to detect fluoride ions is needed, especially for applications in chemical and biological processes. One of the chemical compounds that have the potential to act as sensors is the Schiff bases compounds. This study aims to synthesize a Schiff base-based on salicylaldehyde and to use it as a fluoride ion sensor. The one-pot synthesis approach was carried out at room temperature by mixing salicylaldehyde with hydrazine hydrate or phenylenediamine with a molar ratio of 2:1 in ethanol under stirring for 24 hours. The resulting crystal yield was 80% for salicylaldazine (SB-1) and 83% for phenylsalicylicaldazine (SB-2). SB-1 crystals are bright yellow while SB2 is yellowish orange. The H-NMR test results showed that there were OH and CH-Aromatic groups. The multiplet peaks, that equal with 6H, was observed on SB-2 at chemical shift pf 7.3-7.4 the presence of a phenyl group which is not found in SB-1. The solution of SB-1 and SB-2 in dimethyl sulfoxide (DMSO) solvent tend to be colorless, however, in the presence of F- ions the solution turns orange. This indicates an interaction between SB-1 and SB-2 with F- ions in solution

Keywords: Schiff Bases- One-pot synthesis- Molecular interaction- Fluoride detection

[ABS-2]
Development of Audio Visual Learning Media Integrating Character Education in Chemistry Learning to Facilitate Conceptual Change and Strengthening Students Character

Masrid Pikoli and Astin Lukum

Universitas Negeri Gorontalo

Abstract

Audio visual media is a set of tools that can project moving images and sound. This study aims to produce audio-visual learning media that integrates character education in chemistry learning to facilitate conceptual change and strengthening students character. This research is a development research which includes three stages, namely preliminary studies, development and validation, as well as testing and implementation to produce valid, practical, and effective audio-visual learning media. The validation was carried out by three experts through the Focus Group Discussion. Audio visual media and learning tools developed were tested on students at SMA N 1 Kabila Gorontalo. The research data collection technique used observation and a three-tier diagnostic test. Data were analyzed using qualitative descriptive techniques. The results obtained were that the developed audio visual learning media had validity with a very valid category, practicality with a very high category, and was effective in shifting students^ conceptions from misconceptions and not knowing concepts to knowing concepts with N-Gain in the high category, namely 0.83. The conclusion of this research is that the audio visual learning media and learning tools developed are of good quality.

Keywords: Audio visual media, Chemical Bonding, Conceptual Change, Character

[ABS-6]
Antioxidant and Antibacterial Activity of Methanol extract of Brotowali (Tinospora crispa) stem Bark

Weny J.A Musa, Suleman Duengo, Ahmad Kadir Kilo and Boima Situmeang

Department of Chemistry, State University of Gorontalo
Department of Chemistry, Sekolah Tinggi Analis Kimia Cilegon Banten

Abstract

Brotowali plant is one of the species of the genus Tinospora, known as the species Tinospora crispa. In previouly reseacrh, brotowali plants reported have a variety of biological activities such as antimalarial, antidiabetic, antipieretic, antihyperglycemic. The purpose of this research is to antibacterial and antioxidant activity test brotowali stem from methanol extract. Extraction were using maceration method with methanol as a solvent. Antioxidant activity test using DPPH method. Antibacterial activity test with optical density method with ciprofloxacin as a positive control and methanol as a negative control. The results of the antioxidant activity test stated that the methanol extract of brotowali had IC50 value of 74.72 ppm. The results of antibacterial activity tests on Staphylococcus aureus bacteria showed that the inhibition of bacterial growth at a concentration of 200 ppm was higher.

Keywords: Brotowali, antioxidant, antibacterial, DPPH, Staphylococcus aureus

[ABS-7]
The Effect of the REACT CBA Strategy on the Material of Reaction Rate on Student Achievement at SMA Kristen 1 Tomohon

Marhaini Papia, Wilson A. R. Rombang, Marlina Karundeng

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Abstract

The purpose of this study was to determine whether there was an effect of the REACT CBA strategy on the material reaction rate on student achievement at SMA Kristen 1 Tomohon. The REACT CBA strategy was applied in the experimental class with 33 students in number, and conventinal learning in the control class with 33 students. Studen achievement scores are obtained from the pretest and posttest scores. The results showed that there was no significant difference in the pretest scores of the experimental and control class, namely U = 543,5- p = 0,990 (p < 0,05). While for the posttest scores there is a significant difference between the experimental and control classes where U = 151,0- p = 0,000 (p = <0,05). So that the conclusion is that H0 is rejected and H1 is accepted, it means that there is an effect of the material reaction rate on student achievement.

Keywords: REACT CBA, Learning Achievement, Reaction Rate

[ABS-8]
The influence of the science technology engineering and mathematics learning approach on attitudes and learning outcomes in eleventh grade students of SMA negeri 5 north halmahera for the material on the rate of reaction

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Abstract

The purpose of the study was to determine the effect of the Science Technology Engineering and mathematics (STEM) learning approach on attitudes and learning outcomes on the reaction rate material. This research was conducted at SMA Negeri 5 North Halmahera in the 2019/2020 school year. The research method used is descriptive research design with a pre-test and post-test control design. 30 students of Class XI MIA 1 were randomly selected to be assigned as research sample. Data on students attitudes towards learning chemistry were obtained through a questionnaire of initial test and final test of 20 items and data learning outcomes obtained through pre-test and post-test of 15 objective items. The results of the study obtained an average score of students attitudes towards chemistry after using the STEM learning approach of 93,73 higher than before using the STEM approach 49,73 while the average score of learning outcomes after using the STEM learning approach was 78,33 higher than learning outcomes before using the STEM approach of 37,83. Based on the research findings, this show that there is an effect of the STEM learning approach on students^ attitudes and learning outcomes on the reaction rate material.

Keywords: STEM, Student Attitude, Learning Outcomes, Reaction Rate

[ABS-9]
Uric Acid levels on subchronic oral administration of Cassava leaf extract

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Abstract

Cassava leaf one of herb in Indonesia needed the safety data to develop as herbal medicine. Cassava leaf contains carbohydrate, protein, flavonoid, triterpenoid, saponin, tannin, mineral, and vitamin C. The cassava leaf contained moderate purine potentially increasing the plasma uric acid. This study aims to analyze uric acid levels on plasma rat that given sub chronically cassava leaf extract. This research was an experimental posttest with control group design. The total of 36 adult rat was randomly divided into 4 groups. The experimental groups were treated Cassava leaf extract orally for 45 days. The doses were 80 mg/kg body weight (P1), 400 mg/kg body weight (P2) and 2000 mg/kg body weight. Peripheral blood was taken from orbital sinus in day 45, and was measured the uric acid level. The average of blood uric acid levels for all groups is K (1,2725 mg/dL), P1(2,1289 mg/dL), P2 (1,3756 mg/dL) dan P3 (1,4250 mg/dL). The Anova analyzed resulted that no difference uric acid level between control and experiment groups. We concluded that the sub chronic giving of cassava leaf extract of 80 mg/kg body weight, 400 mg/kg body weight and 2000 mg/kg body weight did not increase the uric acid levels on rat

Keywords: Cassava- absorbtion- Uric acid

[ABS-15]
Production and Optimization Of Sea Salt Quality on the Coast of Tomini Bay

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Abstract

Tomini Bay is a water area with an area of 59,500 km2. Especially for Gorontalo Province, it has a length of about 436.52 Km. Based on this data, the province of Gorontalo, especially the coast of Tomini Bay, has the potential to be the source of raw material for salt production. Generally, the salt production process goes through various stages of the processes, namely the first evaporation process, the second evaporation process, the concentration process, and the crystallization process. The objective of this research is to obtain pure salt that meets the Standards of SNI. The salt production method used are evaporation and purification with re-crystallization techniques by physical means (using hot water) and chemical methods by the addition of chemicals Ca(OH)2, NaOH, and Na2CO3. The results of this study showed that the obtained salt has NaCl content of 97.04%, Ca 0.55%, and Mg 0.28%. The obtained salt does not meet the salt requirements for SNI standards because there is still a large amount of Ca (SNI=0.10) and Mg (SNI=0.06). However, it meets the type of salt group, namely in category 1 with the best quality that meets the requirements for industrial materials and for consumption.

Keywords: Salt, Re-crystallization, Optimization, Salt water

[ABS-44]
Sponge (Porifera) and Sponge-Associated Bacteria as a Bio-Indicator of Heavy Metal Concentration in Teluk Manado

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Abstract

A descriptive study has been carried out on the possibility of using sponges (Porifera) and sponge-associated bacteria as bioindicators of heavy metal concentrations in the Manado Bay area. The sponge was prepared using open system destruction, while the sponge-associated bacteria were taken from the surface and meat parts of the sponges and growing in nutrient agar for 2 x 24 hours. Using Atomic Absorption Spectrophotometry (AAS), the Pb concentration for a sponge is 421.59 ppm, 336.06 ppm, 393.67 ppm, and 477.44 ppm. The Zn concentration is 2.47 and 14.66 ppm. For sponge-associated bacteria, the Pb concentration for surface parts and meat parts ranged from 52.12 micro g/g to 86,96 micro g/g and 63.32 micro g/g to 87.62 micro g/g, the Zn concentration ranged from 8.05 micro g/g to 8.46 micro g/g and 9.70 micro g/g to 9.59 micro g/g, and for Hg concentration, the values ranged from 0.25 micro g/g to 0.04 micro g/g and around 0.04 micro g/g to 0.05 micro g/g. Based on these results it can be concluded that sea sponges and their sponge-associated bacteria can be used as bioindicators to measure heavy metal concentration in waters.

Keywords: Sponge, Sponge-Associated Bacteria, Bio-Indicator

[ABS-50]
SUN PROTECTING FACTOR VALUE OF THE BERINGIN (Ficus benjamina) FRUITS EXTRACT

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Universitas Kristen Indonesia Tomohon

Abstract

Sun Protection Factor or SPF is defined as the ratio between the amount of sunlight energy (in this case UV-B) needed to cause minimal erythema on sun-protected skin with the amount of energy needed to cause minimal erythema on skin that is not protected by sunscreen. The aims of this study is to determine the SPF value of the n-hexane fraction, the ethyl acetate fraction, methanol fraction, ethanol fraction, and butanol fraction from the beringin fruits. SPF measurements can be done using UV-Vis spectrophotometry. The result is the SPF value of n-hexane fraction is 4.935, the ethyl acetate fraction is 19.917, methanol fraction is 4.056, ethanol fraction is 8.342 , and butanol fraction is 0,422 . The ethyl acetate fraction of beringin (ficus benjamina) fruits has the highest SPF value and its categorized as ultra protection.

Keywords: Sunscreen, ficus benjamina, SPF, Fruit

[ABS-64]
LEARNING HIGH SCHOOL CHEMISTRY WITH V-MAKES TECHNIQUES (An Initial Study)

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Abstract

The mental and motoric involvement of students in the high school chemistry learning process is a very important factor in improving the quality of learning. Therefore, learning techniques are needed that can make students actively involved in the learning process, both in the process of direct observation of phenomena or real objects from a chemical compound or mixture, problem solving, concept discovery processes, to the implementation of experiments. This is what underlies the researcher to apply the learning technique ^Visualization-Macroscopic Experiment (abbreviated as V-Makes) as an effort and at the same time a preliminary study to improve the quality of high school chemistry learning. This research method uses a classroom action research design with the stages of the cycle of planning, action, observation, and evaluation/reflection. The subjects of this study were 36 students of class XI IPA at SMAS Makassar Raya, Makassar with the research objects of hydrocarbon chemistry and petroleum. The instruments used in this study were essay items and student response questionnaires to the learning process. The data on learning outcomes and student responses obtained are both indicators in assessing the quality of learning. The results showed that there was an increase in student learning outcomes from cycle 1 (66.66% of students completed) to cycle 2 (97.22% of students completed). Students also responded positively to the high category (average response 1.72 from a maximum response scale of 2.00) to the learning process they experienced through the application of the V-Makes technique.

Keywords: V-Makes technique

[ABS-68]
EFFECT ACTIVATION TIME ON CHEMICAL STRUCTURE AND QUALITY ACTIVATED CARBON FROM COCONUT SHELL

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Abstract

This research about the production and characterization of activated carbon from coconut shell carbon activation with the combination of chemistry and physics activation to determine the effect of chemical activators of the reduction calcination temperature and quality of activated carbon. The coconut shell charcoal was immersed in the solution of H3PO4 (0.5-2.0 M) for 12-24 h. It was then activated on the activation reactor at 500-8000 C with the stream of CO2 20 mL/min and with the variation of time 30-150 min. Characterization of activated carbon included FTIR, SEM, and BET analysis. Results of this research analyzed using SPSS through the test cofficients showed variable temperature influenced by the moisture content, volatile matter, ash content, fixed carbon were bound together along variable absorption of iodine concentration and activation time. The best characteristics of activated carbon generated by a concentration of 1.5 M H3PO4, soaking time was 18 hours, the temperature was 8000 C, and the activation time was 120 minutes. In that conditions resulted in 7.89% moisture content, 19.76% volatile matter, 1.66% ash content, 78.58% fixed carbon, and iodine absorption of 704.29 mg/g. Surface area (BET) 299.43 m2/g, pore volumes 1.71 x 10-1 cm3/g and average pore diameters 11.46&#506-.

Keywords: Coconut Shell, activated carbon, H3PO4, FTIR, SEM, BET

[ABS-72]
FTIR, SEM and XRD Analysis of Activated Carbon from Sago Wastes using Acid Modification

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Abstract

Activated charcoal bioadsorbent is a method that can be developed because the raw material is easy to obtain and does not require large costs such as processing sago. The stages of making activated carbon include the stages of dehydration, carbonization, and extraction of silica using 4% NaOH solution (1:10). The activation stage successively used 250 mL of 1M NaCl, 1M MgCl2, 1M CaCO3, 1M K2Cr2O7 and the addition of 100 mL of 1M HNO3, 3% H2O2, 1M H3PO4 and 4N H2SO4 respectively. The activation process uses a water bath at 700C for 3 hours. In the conventional carbonization stage in a vacuum used drum for 1x24 hours. Physicochemical analysis of activated carbon products, namely moisture content, ash content, pH, Activated Carbon Adsorption Test against Iod Test and methylene blue. FT-IR analysis showed a wide band of 3442.94 cm-1 to 3415.93 cm-1 which showed the free O-H strain vibrations of the OH group in the cellulose molecule. 1178.51 cm - 1 -1039.53 cm - 1-1024.20 cm - 1 C-C and C-O-C glycosidic ether band. SEM data describes the differences in the surface morphological structure of each sample and is supported by XRD data.

Keywords: activated carbon- sago pulp- FTIR- XRD- SEM

COMPUTER SCIENCE

[ABS-3]
Increased Accuracy of Prediction Hepatitis Disease Using the Application of Principal Component Analysis on a Support Vector Machine

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Abstract

Data mining has been widely used to diagnose diseases from medical data. Classification is a data mining technique that can be used to predict disease. In previous studies, a support vector machine was widely used to obtain high accuracy in predicting hepatitis. In this study, the principal component analysis was applied to the support vector machine. Principal component analysis is used to extract features and reduce the number of features or attributes. Principal component analysis can reduce data dimensions without removing important information from the dataset. The extracted and reduced data are then used to classify the support vector machine. Classification performance measurement is done by using a confusion matrix. Hepatitis prediction accuracy achieved was 93.55%. This result is better than the support vector machine classification results without the application of principal component analysis.

Keywords: Data mining, Prediction hepatitis disease, SVM, PCA

[ABS-62]
Application of Convolutional Neural Network for Classification of Skin Cancer Based on Image Data Using Google Colab

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Abstract

Climate change causes the worlds weather to become hotter and has an impact on human health. The direct impact that can be seen is the increase in cases of skin cancer due to rising temperatures. This study aims to perform digital image data classification modeling by implementing the Convolutional Neural Network (CNN) method in cases of skin cancer using Google Colab software. CNN is widely used in data classification analysis because it has a relatively high level of accuracy and significant results in digital image recognition. The data used in this study were images of skin cancer consisting of images of malignant skin cancer and benign skin cancer. There are 1800 image data types of benign skin cancer and 1497 images of malignant skin cancer. For analysis purposes, 2967 training data and 330 testing data images were selected. Epoch variations and learning rate variations were carried out in the training process to determine the best results. Based on the results of the variation of the epoch and the learning rate, the accuracy value is 99.60% and the accuracy validation value is 92.12%. These results were obtained using epoch 100 and a learning rate of 0.00001. Based on prediction testing using the confusion matrix on data testing, the resulting accuracy value is 90% and an error value or error rate value is 10%.

Keywords: Convolutional Neural Network- Classification- Skin cancer- Digital images

EDUCATION

[ABS-13]
INCORPORATION OF ICT-BASED MULTIMEDIA IN MATHEMATICS LEARNING DURING COVID-19 PANDEMIC: ITS EFFECT ON STUDENTS LEARNING ACTIVITY, INTEREST, MOTIVATION, AND METACOGNITIVE KNOWLEDGE

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Abstract

The rapid advancements of science and technology have been highly influential to the learning activity and to the shift of teachers role and students characteristics. Such a condition calls for a re-orientation for an innovative teaching method, particularly amid the COVID-19 pandemic that restricts the direct interaction between teachers and students. ICT-based multimedia is among the applicable methods of online learning strategy to develop students cognitivity, affective competence, and skills that are in conformity with the learning objectives. The purpose of this research was to investigate the effect of incorporation of ICT-based learning multimedia in junior high school. The assessed indicators were the learning activity, interest, motivation, and metacognitive knowledge. The results revealed that the developed ICT-based learning multimedia was effective. Based on the observation, the percentage of students activity arrived at 82.35%, categorized as good. Moreover, the questionnaire data of students learning motivation and interest also yielded good criteria with percentage of 85.20%. In the meantime, the students learning outcomes in the dimension of metacognitive knowledge resulted in 80.22%, or at passed criteria. Therefore, the ICT-based multimedia in curved side geometric shapes was regarded as effective to use within mathematics learning process in junior high school

Keywords: ICT-based multimedia, Learning activity, Interest, Motivation, Metacognitive knowledge

[ABS-14]
Management of Nature Based Physics Learning

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Abstract

This research aims to describe management which includes planning, organizing, implementing and evaluating nature-based learning in Lake Linow for students of the Department of Physics, FMIPA Unima. The method used in this research is a mixed method with a qualitative data frame, while quantitative data supports qualitative data. The design of field activities is tiered from semester I to semester VIII. The research results obtained in this research are starting from the planning stages of analyzing, mission, student needs, observing natural objects, namely Lake Linow, formulating the objectives of field activities, according to activities at level 1 to activity level 4, observation format and Product rubric. The next stage of organizing produces an organizational model and the functions and roles of management components. The implementation stage or implementation is in accordance with the design made and carried out in stages in 4 5-E learning cycle activities (Engagment, Explaration, Explanation, Elaboration, Evaluation). Nature-based learning evaluation according to format, obesity and fulfillment of attractiveness needs, the ability to identify facts, physical phenomena, explain special features, variable concepts, spatial and temporal variations, relationships between variables, and related concepts. The results of this study also obtained references to field conditions and environmental conditions of each zone as well as references to forms of learning activities (observation, measurement, detailed research) which were integrated into several related subjects as field assignments. The results of the evaluation show that the application of management functions in nature-based learning for students of the Department of Physics at the Faculty of Mathematics and Natural Sciences Unima can form the competence of knowledge, attitudes and skills of students, and with nature-based learning through tiered activities can support students in completing studies

Keywords: Manajement, Learning Physics , Natural

[ABS-17]
Analysis of Student Error in Solving Story Problems in Linear Program Materials

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Abstract

The purpose of this research was to determine the percentage of student errors in solving story problems on the linear program material. The errors noted were misunderstandings of questions, errors in mathematical modeling, errors in calculating / solving, and errors in drawing conclusions. The research was conducted on class XI MIPA students of SMA Negeri 1 Langowan. The results showed that all students made mistakes solving story problems with the material of the linear program. There were 38 (23.89%) student errors at the question understanding stage. There were 5 (3.14%) errors at the mathematical modeling stage. There are 90 (56.60%) errors at the computation / completion stage. There were 24 (15.09%) errors at the conclusion stage. There were 2 (1.25%) other mistakes made by students.

Keywords: student error analysis, linear program, problem story

[ABS-36]
MATHEMATICAL LITERACY PROBLEMS: USING THE CONTEXT OF TEMPANG COMMUNITY

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Abstract

This study aims to produce mathematical literacy problems using the context of Tempang community and determine the potential effects of the developed mathematical literacy problems on students^ mathematical literacy skill at SMP Negeri 9 Langowan. This research is categorized as development research. The subjects of this research is ninth grade students. Based on the analysis, it obtains 3 students for the one to one stage, 6 students for the small group stage, and 20 students for the field test stage as its research subjects. The data in this study are collected using observation, walk through, tests and interviews technique. The data analysis are conducted by the analysis of document, walk through, tests and interview result. Based on the data analysis, it obtains 10 mathematical literacy problems that relates to Tempang community. The average of students^ qualification achievement at the field test stage which use literacy problems that contain the context of Tempang community is 81.1% and categorized as good.

Keywords: Mathematical Literacy, context of Tempang community

[ABS-37]
UTILIZING LOCAL INGENIOUSNESS CONTEXTS IN DEVELOPING ASSESSMENT INSTRUMENT FOR MEASURING MATHEMATICS HIGHER-ORDER-THINKING-SKILLS

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Abstract

Assessment should reflect the mathematics that is important for students to learn. This research and development study is conducted to design an assessment instrument for measuring higher-order thinking skills (HOTS) of junior high school mathematics students by utilizing the local contexts of the living ingeniousness of North Sulawesi. A modified ADDIE model of research development is combined with the Delphi technique has been applied. Nine mathematics teachers and three lecturers involved in this study, and 124 students of 8th graders from 6 schools in the region participated. The results indicate that the instrument for assessing HOTS ability in mathematics can be developed by exploiting the richness of local ingenious contexts that makes mathematics practically close to their life. The development of the instrument was based on the 3 upper levels of Bloom revised taxonomy, which is the ability to analyze (C4), evaluate (C5), and create (C6), aligned with the cognitive domain indicators mostly measured on the TIMSS test questions, such as solving routine problems, knowing facts and procedures, using complex procedures, solving problems, communicating, and reasoning as well. Seven different kinds of local businesses or livelihood have been identified as relevant contexts for being used in developing instruments of HOTS mathematics assessment. The level of difficulty and discrimination index was also calculated. In addition to this research, barriers to teachers in designing and developing HOTS assessment were identified.

Keywords: assessment instrument, higher-order-thinking-skill, local ingenious context

[ABS-38]
Development of Integrated Science Learning Tools Based on Multiple Representations to Improve Scientific Literacy

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Abstract

Research has been carried out which aims to, first, develop integrative science learning tools based on multiple representations including lesson plans, Student Activity Sheets, teaching materials, scientific literacy tests and conceptual understanding- second, knowing the impact of developing multiple representational based integrative science learning tools on scientific literacy skills and understanding the concepts of temperature and heat. Research is a type of research in Education Research and Development (R & D) which refers to the 4-D method. Products that have been produced from the completed research stages are learning tools. The resulting learning tools have been assessed by experts in their fields and users in the fields. The validation results show that the resulting device is in a good category. The test results of the device show an increase in students^ scientific literacy skills and understanding of science concepts, this is indicated by the gain values 0.42 and 0.53 which are included in the medium category

Keywords: scientific literacy, integrative science, multiple representations- temperature and heat

[ABS-42]
Learning Based on Blended Learning and Discovery Learning Model in the Subject Learning and Instruction Biology

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Abstract

Study and learning course in the biology education study program with one of the formulations of learning outcomes is to optimize the mastery and use of basic teaching skills. Biology education study program students as a prospective teacher should Let teaching of basic skills because it concerns the effectiveness of the achievement learning objectives. The observation result shows students have not been able to optimize the mastery and use of basic teaching skills, because they only read without understanding what he was learning, so that the course team changing strategies to teach basic teaching skills through blended learning, until students find out for themselves concepts that have been learned. Research that aims to describe blended learning and based learning discovery learning model of learning in the course of studying and learning biology, including the type of qualitative research with research subjects biology education study program students of 2016, 2017, and 2018, when they are in semester 3. Collected research data reduced, identified, described, analyzed, and checked its legality by using the triangulation method. The results showed that the students^ mastery of concepts to basic teaching skills to be better with the application of blended learning-based learning and discovery learning models in the course of study and learning biology.

Keywords: Basic Teaching Skills, e-Learning, Biology Education

[ABS-43]
Mathematics Blended Learning Assessment Using Digital Project

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Abstract

Assessment is an integral part of learning. One of the mathematics learning process in the era of disruption is blended learning which is expected to solve various problems in face-to-face meetings by utilizing information technology. The implementation of blended learning is constrained in its assessment, if only students are asked to collect the results of their assignments through application or email. One solution is with digital project assessment. The use of digital projects in question can be integrated into a blended and separate learning application system. It should be noted that project assessment, including digital projects assessment, is one of the authentic assessments that must be qualified in its mathematics authentic task and scoring rubric.

Keywords: blended learning, mathematical assessment, digital project

[ABS-46]
A STUDY OF THE QUALITY OF NOVICE TEACHER-MADE-TEST OF SECONDARY SCHOOL MATHEMATICS

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Abstract

The teacher-made test (TMT) is one of the valuable instruments in the hands to measure students^ learning and or to evaluate instruction. This descriptive quantitative study aims at analyzing the quality of TMT of secondary school mathematics teachers who participated in the PPG-UNIMA certification program. Each of the fifteen participant teachers involved in this study was asked to construct and develop twenty multiple-choice type items (O) and five essay questions (E) of several school mathematics topics. The quality of TMT was analyzed thru items^ reliability, difficulty level, discrimination index, and the effectiveness of distractors. A panel of five experts is formed to review items^ content and construct validity. Results showed that most TMT has low reliability (.67 for the multiple-choice item, and .62 for essay question), only 16.7% of O have good discrimination index, and 60.5% of O categorized as fair- 33.3% of E has good discrimination index, and 46.7% fair. In terms of the item^s level of difficulty, 19% were difficult items, 48.5% moderate, and 32.5% easy. This study suggests to novice mathematics teachers to pay more attention and have more practice in constructing and developing assessment instruments.

Keywords: the quality of test, validity, reliability, discrimination power, level of difficulty, distractors

[ABS-47]
THE GEOGRAPHY STUDENTS PERCEPTION ON THE USE OF GOOGLE CLASSROOM AS VIRTUAL CLASS

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Abstract

The Era of 4.0 revolution changes the paradigm of education and learning. Offline learning is starting to be abandoned and replaced with online learning. One application that is often used in online or virtual class learning is the Google Classroom. Google classroom has features for teachers to manage classes, create assignments, create quizzes, share material, and directly evaluate student work. This study aims to see students^ perceptions of using google classroom. This research method uses descriptive research methods. The results showed that as many as indicators of learning geography showed that the average student who answered agreed 33.54%, strongly agreed, namely 25.72%. As for those who strongly disagree 2.88%. On the second indicator which is google classrom performance that shows the app makes it easier for file storage, easier to be understood, and effective and efficient in timely manner. This can be seen from the result that 43.77% of student agreed and the other 42.07% answered they are strongly agree to the statement. The third indicator of student admission to the ease of Google Classroom shows that the average student answered agree by 43.9%, who stated strongly agree at 34.15% and who expressed strongly disagree at 3.6%. This shows that Google Classroom is very easy to use. The fourth indicator of Social Influence on the Use of Google Classroom shows the average answer agrees at 38.4% and states strongly disagrees with 3.57%. This shows that the social environment greatly influences the use of Google Classroom.

Keywords: Perception, Google classroom

[ABS-49]
Mathematical problem solving ability based on self-efficacy in ICT-assisted preprospec learning models

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Abstract

Mathematical problems solving ability is main goal of learning mathematics. In addition, students in the Mathematics Education study program also need affective abilities, namely self-efficacy. self-efficacy makes students able to have a efficacy through the experiences they have. If students have high self-efficacy, students can confidently carry out the steps to solve mathematical problems given to them. One learning model that can facilitate the enhancement of these two abilities is ICT-assisted preprospec learning models. The main purpose of this research is to analyze comprehensively the mathematical problem solving ability based on self-efficacy in ICT-assisted preprospec learning models. This research used quantitative methods. The population of this research consisted of all students in the mathematics department of one of universities in Central Java, Indonesia. The sample was groups of students in the Study Program of Mathematics Education who enrolled in Integral Calculus course. From these study programs, a sample groups were selected randomly. This research used various instruments: Test of Mathematical Problem Solving Ability, and self-efficacy scale. The data were analyzed by using one way anova. From this research, it can be concluded that the enhancement of the students^ Mathematical Problem Solving Ability based on self-efficacy give no different result.

Keywords: Mathematical problem solving, self efficacy, preprospec, ICT

[ABS-52]
THE INFLUENCE OF MINI RESEARCH ASSIGNMENT METHODS ON STUDENTS HIGH LEVEL THINKING ABILITY CLASS X ENVIRONMENTAL POLLUTION MATERIALS STATE HIGH SCHOOL 2 TONDANO

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Abstract

Inadequate or monotonous learning models cause students to be less active and difficult to understand the material taught, especially in learning environmental pollution and research methods have not been implemented.This study aims to improve students high-level thinking skills so that learning outcomes are good after following the learning process through the mini research assignment method.This research was conducted at SMA Negeri 2 Tondano. This research is using experimental method. The population in this study was class X consisting of 2 classes, namely class XA as an experimental class consisting of 25 students and class XB as a control class consisting of 25 students.The results showed that the average value of the pretest results of students in the experimental class 24,96 and the results of the experimental class posttest to 77,8 while the average value of the control class pretest results 23,24 and the average results of the control class posttest 69,08 .The conclusion in this study is the use of mini research assignment methods has an influence in improving student learning outcomes.

Keywords: HOTS, Mini Research, Water Pollution.

[ABS-56]
DESCRIPTION AND ANALYSIS OF PHYSICS PROCESS ON ISLAND HILLY LAND FOR LEARNING THE AVAILABILITY OF CLEAN WATER FOR JUNIOR HIGH SCHOOL STUDENTS

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Abstract

The surrounding environment has many facts and phenomena that teachers can use as a learning resource for students. The characteristics of land and process phisycs the inclusion of rainwater into the surface of the soil can be excavating physical concepts to become learning materials. This research aims to measure, analyze and describe the process of phisycs infiltration and erosisurfaces and design and implement learning activities outside the classroom. This research uses methods of descriptive analysis. The outdoor research shows that the fastest infiltration process is on grass fields and the largest erosion potential on the open land. The results of the infiltration and erosion measurement of the surface are connected with the concept of science based on the fact phenomenon, implemented to students with a form of assessment of the process ability and learning group achievement of students seen in the average results, As for the level of diversity of score variation between facts and the overall phenomenon seen from the value of variances. The results of this study became a teaching material as a supporter of science learning design that utilizes the environment in the form of thematic learning.

Keywords: Teaching materials, surfaces, infiltration and learning achievements.

[ABS-57]
Analysis of the thematic task of coastal damage in the mastery of physics concepts connected with the concept of biology

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Abstract

This study aims to describe the relationship between the mastery of physics concepts with biological concepts in the design and implementation of thematic tasks of abrasion and damage to coastal areas. From the results of the study, it shows that students understand the relationship between physics concepts and the context of abrasion and coastal damage and the relationship between physics concepts and biology subjects, so it can be concluded that the development of potential thematic learning can be developed through thematic assignments because through the learning process, students can improve the concepts relationship between subjects and can motivate students to improve students^ understanding and ability to analyze natural events, social problems, local wisdom related to abrasion and damage to coastal areas.

Keywords: Thematic Task, Abrasion and Damage to Coastal Areas,physics concepts,biology concept

[ABS-61]
Analysis of Online Learning Models during the Covid Pandemic 19: Case Studies from the Perspective of Students in the Science Education Study Program

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Abstract

The period of the Covid 19 pandemic has forced all activities in educational institutions to maintain distance and all material delivery through unusual media and methods. To get around this unfavorable situation, online methods are one of the most effective options to overcome it. This research aims to analyze the most effective online science learning model from a student^s point of view or perspective. This research is a case study conducted through a survey method using an online questionnaire using google form. The subjects of this research were all students of the Science Education Study Program FMIPA Universitas Negeri Semarang Odd Semester of 2020. The results of this research indicate that the combination model of LMS (Learning Management System) and SLNs (Social Learning Networks) is the most effective according to student perspectives.

Keywords: pandemi covid 19, e-learning, Learning Management System, Sosial Learning Networks

[ABS-63]
The Development of Geogebra-Assisted Mathematics Learning Media on Geometry of Space Flat-Side of Cubes and Blocks

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Abstract

The purpose of this research is to develop the mathematics learning media assisted by Geogebra on Geometry of space flat-side of cubes and blocks. This study uses the ADDIE development model, which are Analysis, Design, Development, Implementation and Evaluation. The subjects of this study were students of class VIII SMP. The results of the study based on the validation of media experts and material experts show that this Geogebra-assisted learning media is appropriate and suitable for use in the mathematics learning process. Meanwhile, based on the evaluation by the teacher, this developed media achieved practical criteria. The overall student response to this learning media is in the very positive category with a percentage of 87.1%. Thus it can be concluded that the Geogebra-assisted mathematics learning media is feasible, valid and practical to be used in mathematics learning on geometry of space flat-side of cubes and blocks

Keywords: Mathematics Learning Media, Geogebra

[ABS-69]
APPLICATION EFFECT OF LEARNING BASED LOCAL CULTURE TO LITERASI SAINS OF YUNIR HIGH SCHOOL STUDENTS 1 KABILA BONE MOLOTABU BONE BOLANGO OF REGENCY

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Abstract

This research head for to see effect of aplication of learning based local cultural literasi sains of students (yunior high school) SMP 1 Kabila Bone Molotabuto Bone Bolango of regency aspecially by twenty six students the method of research use experiment method by kind of research pre experiment design to do only one group without comparison of standard. Design this research is the one group pree test and post test. Result this research to show that be fount effect of application of learning based local culture to literasi sains of students sevent grade of SMP 1 Kabila Bone Molotabu bone Bolango of regency. Category literasi sains advance to the second of meeting consist of Fungsional, conseptual./procedural dan multidimensional

Keywords: Local Culture and, Literasi Sains

[ABS-73]
Biodiversity Literacy In Science Education

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Abstract

Teaching the concept of biodiversity in learning activities especially science education is an important urgency to bring up biodiversity literacy competence. This article aims to examine the concept of biodiversity and ecosystems in science education activities, the level of student literacy on biodiversity, and several learning models in science education that can be applied in increasing the biodiversity literacy of students. The method used in this study is Knowledge mapping that begins with mapping students knowledge about biodiversity, covering the breadth of knowledge and depth of knowledge- Focus Group Discussion (FGD) involving students and lecturers- Experiments applying three learning models in lecture activities for biodiversity materials and comparing the three models tested. Results obtained from the study is that literacy competence biodiversity is a form that can be grown on the p Education science. The existence of biodiversity literacy capabilities will further have a positive impact in efforts to maintain, protect, increase awareness of the importance of biodiversity. The application of biodiversity literacy can be built into several models, techniques or learning patterns that are appropriate to aspects of the surrounding environment, environmental issues that occur, and the ability of students. Participants learners who have literacy skills biodiversity is good, will have a character of sensitivity to any changes that exist in the surrounding environment. The presence of this character in the later stages can me n make learners make efforts to establish, maintain and preserve biodiversity and ecosystem.

Keywords: Science education, biodiversity literacy

[ABS-77]
The Influence of Edmodo Application toward Students understanding of Slat Hydolysis Topic

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Abstract

The research aims at investigating the influence of edmodo application toward students understanding of the slat hydrolysis topic. It is quantitative research with a non-equivalent control group design. The samples for each experimental class and control class were 25. The data collection was by objective test as the instrument that consisted of the salt hydrolysis material. The technique of data analysis to verify the hypothesis applied t-test. Based on the statistical test result, the average value of post-test for the experimental class using the edmodo application was 79,73, while the average value of post-test for the control class using the edmodo application was 55,46. The data analysis result for students understanding shows that tcount was higer than ttable or 20,06> 1,67 at a significance level of 0,05, which means that H1 was acceted and H0 was rejected. Therefore, it can be concluded that there is an influence of edmodo application toward students understanding in the slat hydrolysis topic.

Keywords: Edmodo application, Salt Hydrolysis

[ABS-78]
Identification of Students^ Conceptual Understanding on Electrolyte and Non-Electrolyte Solution Material Using a Three Tier Multiple Choice Test.

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Abstract

This study aims to identify the percentage of students^ conceptual understanding using the Three-Tier Multiple-Choice test on electrolyte and non-electrolyte solutions. The research method used is descriptive quantitative. The instrument used was a Three-Tier Multiple-Choice test. The research subjects were class X IPA MAN 1 Gorontalo City with a total sample of 20 students. The data were processed based on the students^ answer patterns which were grouped into categories of understanding the concept, not understanding the concept and misconceptions (misconceptions 1,2, and 3). The results showed that the category of understanding the concept of students was in the low category with a percentage of 28%, did not understand the concept in the high category with a percentage of 54%, and misconceptions were in the low category with a percentage of 18%. Of the 18% students who experienced misconception, the percentage was 8% misconception 1, misconception 2 was 2%, and misconception 3 was 8%.

Keywords: Conceptual Understanding, Electrolyte and Non Electrolyte Solution, Three-Tier Multiple Choice

[ABS-5]
Numerical Solution for System with Atangana-Baleanu-Caputo Derivative: an Influenza Epidemic Model

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Abstract

In this work, the fractional three strains influenza epidemic model with vaccination for strain 1 and awareness of strain 2 is studied. We use Atangana-Baleanu in Caputo-sense. First, we show that the model has the unique solution. We investigate the effect of existence the vaccination and awareness to the solution and perform the numerical simulation with various values of derivative order. It is shown that the maximum values of infectious decreases as the decreasing of the derivative order and the vaccination and awareness can reduce the infectious with strain 1 and strain 2, respectively, but can increase the infectious with strain 3.

Keywords: vaccination- awareness- influenza epidemic model- Atangana-Baleanu-Caputo

[ABS-16]
Distance Weight of GWR-Kriging Model for Stunting Cases in East Java

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Abstract

The chosen of distance weights is needed to form an accurate Geographically Weighting Regression model. There are 3 type of distance weights namely Gaussian kernel, Bisquare kernel and Tricube kernel. The weighting in GWR describes the closeness relation between locations. For data that has spatial heterogeneity, GWR models are more suitable models than OLS models. This study was conducted with the aim of obtaining the best distance weighting based on minimum cross-validation method. Using secondary data from the Health Department in East Java with 34 district for observation, the dependent variable is stunting and five independent variables that influence stunting cases. Based on the result, GWR models with fixed gaussian models produces a better accuracy in higher R^2 values compared to OLS models. The predicted map of the spread stunting cases conducted by interpolation GWR Kriging using exponential semivariogram.

Keywords: GWR-Distance Weights-Kriging

[ABS-31]
DEVELOPMENT OF LEARNING DEVICES FOR PROBLEM SOLVING MODELS FOR ARYTHMETICS LINE MATERIALS FOR KAKAS STATE HIGH SCHOOLS

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Abstract

This study aims to produce mathematics learning tools on the Arithmetic Sequence material using the Problem Solving learning model with the Realistic Mathematics Learning Approach of students in class XI SMA Negeri 1 Kakas that meet the criteria of validity, practicality, and effectiveness. This research method is a research on the development of learning tools and evaluation of learning outcomes. The learning tools include learning implementation plans, student worksheets and evaluation of learning outcomes in the Arithmetic Line material with a modified 4-D model. From the results of this study it can be concluded that: (a) at the design stage the resulting learning device is a lesson plan, student worksheets and evaluation of learning outcomes. Validation instruments and observation sheets use instruments that have been developed by researchers through several modifications. (b) This study uses content validation and field trials with the results of the validation showing that the learning implementation plan and student worksheets are declared good and can be used with minor revisions, while the evaluation of learning outcomes includes indicators of assessment criteria. The results of field trials show that some aspects of learning are ineffective, and revisions are carried out by revising learning tools to produce final tools. while the evaluation of learning outcomes seen from the index of validity and reliability is feasible without any significant revisions.

Keywords: Devices, Learning, Problem Solving, Arithmetic Sequences

[ABS-41]
Development of Mathematics Literacy Problems Based Bentenan's Textile for Junior High School Students

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Abstract

This study aims to produce mathematics literacy problems based on the values of local wisdom in North Sulawesi Province, namely bentenan^s textile that are valid and practical. The research method used is development research which consists of the stage of Analysis (needs analysis, curriculum, student^s character), Design, Development, Implementation, Evaluation. The subjects of this study were VIII grade students of SMP Negeri 4 Tondano. The results of the study were valid and practical mathematics literacy problems based on bentenan^s textile. The validity is known from the results of the validator^s assessment on the validation sheet which states that the questions developed are good based on the assessment of content, construct and language and practicality is known from the results of individual and small group trial results which show that all students can use mathematics literacy problems based bentenan^s textile well.

Keywords: Mathematics Literacy Problems, Bentenan^s Textile

[ABS-18]
TEACHING AND LEARNING OF ELECTRIC CHARGE WITH PIMCA MODEL

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Abstract

Research on the physics learning of electric charge has been carried out using MR-SR (Multiple Representation and Semiotic Resources). This reported research aims to find out the outcomes of student learning using the PIMCA learning model (Presentation, Idea Mapping, Conceptualization, and Assessment formative) introduced and developed by Cosmas Poluakan. The research was conducted at the Department of Physics, Manado State University, with 22 pre-service teacher students as respondents using the One Group Pretest-Posttest Design. The instruments used in the form of pretest and posttest which have been tested and validated. The research implementation stage starts from the pretest, then the implementation of physics learning follows the 4 steps of the PIMCA model. The results of data processing and analysis obtained an average pretest score is 19 and an average posttest score is 75. There was an increase in concept mastery, from the idea mapping stage only 2 concepts are correct to drafting concept mapping, 6 concepts are correct from 10 concepts that were used as references. PIMCA MR-SR learning model is very effective in helping students find and understand the correct concepts of physics. The use of the PIMCA-based MR-SR learning model as a new learning model in the teaching and learning process is very effective in learning physics, mathematics and science.

Keywords: ELECTRIC CHARGE, PIMCA, MR-SR.

[ABS-19]
ANALYSIS OF STUDENT DIFFICULTIES IN LEARNING REFRACTION OF LIGHT

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Abstract

The use of semiotic resources in developing abilities and skills in physics problems is very important. PIMCA learning model (Presentation, Idea Mapping, Conceptualization and Formative Assessment) introduced and developed by Cosmas Poluakan is the focus of this research. The purpose of this study was to analyze student difficulties on learning the refraction using the PIMCA model based on multi-representation (MR). The research method is a descriptive analysis method, with the procedure begins with giving a pretest, then followed by the 4 stages of PIMCA learning. The research was conducted in the Department of Physics, Manado State University, with 23 students as respondents. The test instrument used for this research has been validated. After processing and analyzing the data, the pretest average score was 15.9 and the posttest average score was 60.2. These results indicate that even though there is an increase in the average proportion of mastery of the refraction of light concept, generally students still have difficulty drawing the angle of incidence, direction of refraction and the position of refraction for the arrangement of 2 mediums. The results of this research recommend that in order to understand the concept of refraction, the use of the PIMCA model needs to provide more practice questions.

Keywords: PIMCA, Refraction Of Light

MATHEMATICS

[ABS-34]
Dirichlet Problem in Generalized Morrey Spaces

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Abstract

In this paper, we prove that the weak solution of the Dirichlet problem, with the known term belongs to the generalized Morrey spaces, is the element of the generalized weak Morrey spaces.

Keywords: Generalized Morrey spaces- Dirichlet problem

[ABS-39]
Modeling Soil Teksture Silt in DAS Kalikonto Using Geographically Weighted Regression

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Abstract

Multiple linear regression is a method used to model or predict an object that sees the relationship between a dependent variable and a group of independent variables. Geographically Weighted Regression (GWR) is the development of multiple linear regression involving geographical factors. In this study, both methods were used in the study to analyze one of the soil elements, namely the silt soil texture. Through the Digital Elevation Model (DEM) data, the topographic variables used in the study are Eastness Aspects (Ae), Northness Aspects (An), Slope (S), Unsphericity Curvature (M), Vertical Curvature (Kv), Horizontal Curvature (Kh), Accumulation Curvature (Ka) and Elevation (Elv). The results showed that the GWR model with Fixed Gaussian Kernel weighting is better than the multiple linear regression model because the R^2 value of GWR value is 57% greater than the multiple regression, which is 55.03%. The predictive mapping of the spatial distribution of the Silt soil texture is described by the kriging interpolation method which produces predictions ranging from 11.7 to 53.9. So that the prediction model will approach the actual situation in the field because it has included weighting variables in the model formed for each observation location.

Keywords: GWR, Fixed Gaussian Kernel

[ABS-59]
Necessary and sufficient conditions for Stein-Weiss Operator on Orlicz spaces

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Abstract

As the result of Stein-Weiss, the Stein-Weiss Operator is bounded on Orlicz spaces. In this paper we want to find the necessary and sufficient condition for Stein-Weiss Operator on Orlicz spaces.

Keywords: Orlicz spaces, Fractional Integral, Stein-Weiss Operator, Boundedness.

PHYSICS

[ABS-21]
Analysis of Daily Dynamics of Thermal Interaction of Temperature and Ocean Current Flow in Seaweed Growth Areas

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Abstract

ABSTRACT

Seaweed (Caulerpa sp) is a marine biota whose growth is influenced by physical parameters. Thermal interaction analysis was carried out on sea water temperature and ocean current velocity, as well as mathematical modeling of temporal and spatial changes in sea water temperature to estimate the ideal range of temperature and velocity of ocean currents as a characterization of the ecological conditions of the waters. seaweed zone. Temperature measurements were carried out at 4 depth variations using a current meter when sunlight shone on the ocean. Measurement of the speed and direction of the current is carried out using a current meter during the full moon. The Fourier function or periodic function determines mathematical modeling. The results showed that the measurement of sea water temperature at four depth variations experienced changes because it was influenced by the intensity of solar radiation. Sea water temperature decreases with increasing depth. During one cycle the speed and direction of the ocean currents change periodically, with the average flow velocity in the seaweed area is 7.4 meters / minute and outside the seaweed area is 18.75 meters / minute which leads to the southwest when sea water high tide and to the northeast at low tide. The daily temporal change in ocean current velocity on each measurement transect shows the same form which can be expressed by the mathematical model of the Fourier function. The temperature data measured are in the ideal data range for the growth of seaweed according to the results of research conducted by Michel DS 2012. Temperature data, current velocity and the Fourier function describing the pattern of changes in current velocity can be used as basic data in the engineering of ideal natural conditions for seaweed growth. .

Keywords: Seaweed, Fourier Function, Sea Water Temperature, Speed and Direction of Flow.

[ABS-22]
PIMCA LEARNING MODELS TO IMPROVE STUDENT LEARNING OUTCOMES IN OPTIC MAGNIFYING GLASS TOOL

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Abstract

Most of educational research highlights the causes of low student learning outcomes. One of them is the selection of the learning model to be used. This research relates to the use of the MR-SR-based on PIMCA learning model in the Optic Magnifying Glass Tool subject. The purpose of this research was to determine the improvement in student learning outcomes on the magnifying glass tool subject using the PIMCA (presentation, idea mapping, conceptualization and assessment formative) learning model introduced and developed by Cosmas Poluakan. The method used in this study was a group pretest-posttest design. The research was carried out on the students of physics education FMIPA UNIMA with a total of 28 students as respondents. The research instrument used was a test. The research process started with the pre-test, continued with the implementation of physics learning according to the 4 steps of the PIMCA model and ended with a post-test. The results showed that the mean value before the test was 26.43 and the mean value after the test was 72.9. The results showed that the MR-SR-based PIMCA learning model can improve student learning outcomes to properly understand concepts of physics, especially in the subject of magnifying glass tool.

Keywords: pimca model, mr-sr, optic magnifying glass tool

[ABS-23]
TEACHING CONVEX LENS MATERIALS WITH A PIMCA MODEL: HOW DID IT GO?

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Abstract

This research is based on learning physics on convex lens material with the PIMCA model based on MR-SR (multiple representation - semiotic source). PIMCA (Presentation, Idea Mapping, Conceptualization, Formative Assessment) is a new learning model based on MR-SR which was introduced and developed by Cosmas Poluakan. This study aims to see the increase in the average learning outcomes of physics education students in the odd semester. The method used in this research is quantitative comparative design with one group pretest - posttest design. The research was conducted in the physics education department of Manado State University with 24 students as respondents. The instrument used has been tested and validated. The research procedure starts from the initial study on students and then the pretest then performs 4 stages of the PIMCA model (presentation, idea mapping, conceptualization, formative assessment) then posttest. From the results of data processing & analysis, it was found that the average pretest score was 23 and the average posttest score was 79 with a standard ideal value of 75, then the gain-test value was 1.0769 where the data showed a high increase in learning outcomes after the implementation of PIMCA. And it can be concluded that the PIMCA learning model is very good at improving understanding of the concept of the convex lens.

Keywords: Pimca Model,Convex Lenses, Mr-Sr.

[ABS-25]
The PIMCA model for learning the Doppler effect uses a multiple-choice assessment

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Abstract

An important factor for the effectiveness of learning is an assessment factor for both the process and learning outcomes. Research has been carried out related to the use of multiple-choice assessment in the MR-SR based PIMCA (Presentation, Idea Mapping, Conceptualization, Assessment) learning model introduced and developed by Cosmas Poluakan. This study aims to determine the level of understanding of the physics concept of the Doppler effect with the PIMCA model. The research method uses concurrent mixed methods. The research stage was started with pre-test, followed by PIMCA model treatment which was interspersed with interviews and ended with posttest. The research was conducted at the Faculty of Mathematics and Natural Sciences, UNIMA, with 24 student teacher candidates as respondents. The research instrument used a multiple-choice model (MMC) with a written test technique. The results of data analysis obtained a pre-test score of 3.0 and a post-test score of 6.2 and continued with the t test and obtained a value of t: 0.005 <0.05. The results showed that using the PIMCA model using multiple-choice assessments could improve understanding of the physics concept of the Doppler effect.

Keywords: PIMCA, Multiple Choice Model, The doppler effect, MR-SR

[ABS-26]
USE OF THE FOUR-TIER DIAGNOSTIC TEST FORMAT WITH PIMCA MODEL ON OPTICAL MICROSCOPE TOOLS

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Abstract

In learning physics, students often find misconceptions. This research aims to determine misconceptions on the subject of an optical microscope by using the four-tier diagnostic test with the PIMCA model (Presentation, idea mapping, conceptualization, and assessment formative) which was introduced and developed by Cosmas Poluakan. The method used is the One Group Pretest - Posttest Design with 24 respondents as prospective physics teachers students at the Department of Physics, Manado State University. The instrument used is a test instrument in the form of a (four-tier diagnostic test). The research started with the pre-test, the implementation of the physics learning followed the 4 steps of the PIMCA model and ended with a post-test. The results showed a pre-test average value of 29.17 and the average post-test value of 77.5. Based on the research results, it is shown that the learning outcomes of the students with the PIMCA MR-SR learning model increase on the subject of the optical microscope.

Keywords: PIMCA, Four-tier Diagnostic test, Microscope optical instrument

[ABS-27]
IMPLEMENTATION OF THE PIMCA MODEL TO LEARNING CONVEX MIRRORS

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Abstract

Learning in the 4.0 era requires various learning models, one of which is the MR-SR based PIMCA learning model (Presentationing, Idea Mapping, Conceptualization, Assessment Formative) which presents the same concept in several formats. This research aims to determine the increase in student learning outcomes before and after implementing the MR-SR based PIMCA learning model introduced and developed by Cosmas Poluakan. The research method used for this research is one group pre-test post-test design. This research of conducted in the Department of Physics, Manado State University, with 29 student respondents. The instrument used on this research was instrument test based MR-SR that has been tested and validated. The procedure begins with formulate the problem, manage, analyze the data, and conclusion. The results of the data analysis showed that the average score before the test of 20,69 and the average score after the test is 72,41. With a maximum value of 75, a gain of 0.9 is obtained. This means that there is an increase in learning outcomes in the high category because g > 0,7. The results of this research indicate that the MR-SR based PIMCA learning model can improve student learning outcomes in mastery the concepts of physics.

Keywords: PIMCA, MR-SR, Convex Mirror

[ABS-28]
STUDENT LEARNING DIFFICULTIES IN UNDERSTANDING THE LORENTZ FORCE

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Abstract

The complexity of physics learning problems today indicates the need for a learning innovation model. Research has been carried out using the PIMCA learning model introduced by Cosmas Poluakan. The purpose of this study is to describe the learning difficulties of the third semester students of Physics Education study program, in understanding the Lorentz force concept through learning using 4 stages of PIMCA learning model based on MR-SR (multiple representations - semiotic source) which includes the Presentation stage, Idea Mapping, Conceptualize, and Formative Assessment. The research method is a descriptive analysis method, with the procedure beginning with giving a pretest, then following the 4 stages of PIMCA learning. The results showed that the average proportion of pretest results was 7% and the average proportion of post-test results was 37%. These results indicate that even though there is an increase in the average proportion of mastery of the Lorentz force concept, generally students still have difficulty in writing down the complete vector magnitude, determining the relationship of force, electric current and magnetic field in a three-dimensional coordinate system and also need to be given more time so that students more freely explore the concept of Lorentz force. The results of this study recommend that in order to understand the Lorentz force concept, the use of the PIMCA model needs to be accompanied by giving more practice questions, and doing virtual practicum.

Keywords: PIMCA, Lorentz Force

[ABS-29]
PHYPHOX APPLICATION WITH PIMCA LEARNING MODEL

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Abstract

Has conducted research related to the Doppler effects experiment using the Phyphox application with the PIMCA learning model. Online laboratories will be the solution in the era of the Covid-19 pandemic, which still requires students to learn from home. PIMCA learning model, introduced by Cosmas Poluakan, is go together by experimental steps with the Phyphox application. The purpose of this research is to describe the ability of students to understand the concept of the Doppler effects through Doppler effects experiments. The research method begins with preliminary tests and followed by conduct the experiments with Phyphox after the PIMCA model step. The research was conducted in the physics department of Manado State University on odd semester students. The results showed that the average percentage of pre-test results was 28.125%, while the average percentage after the test was 78.125%. These results show that by doing the Phyphox experiment with PIMCA learning, students can improve their mastery the concept of Doppler effects. The observations also showed that experiments with the Phyphox application with PIMCA model learning steps could be carried out individually. The implications of this study makes it possible to carry out individual experiments at anytime and anywhere.

Keywords: Phyphox, PIMCA model

[ABS-32]
THE USE OF THE MR-SR BASED PIMCA LEARNING MODEL IN EYE AS OPTICAL TOOLS SUBJECT

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Abstract

The learning model has long been the focus in almost all research on physics education. Research was carried out on the physics learning model in the subject optical tool. The purpose of this study was to find out learning outcomes using the PIMCA learning model (Presentation, Idea Mapping, Conceptualization, Assessment Formative) introduced and developed by Cosmas Poluakan. This research method uses the group pretest-postest design. This research was conducted at the Manado State University Department of Physics with 24 students as respondents. The data collection tool was a test. The research procedure started with the pre-test, followed by the implementation of physics learning according to the four steps of the PIMCA model, which ended with a post-test. The results of the data analysis gave an average of 43.75 before the test and 77.08 after the test. The results of this study show that student learning outcomes increase in optical eye subject. The results showed that the MR-SR-based PIMCA learning model was very effective in the physics learning process of eye as an optical tool subject.

Keywords: PIMCA, MR-SR, Physics, Optical

[ABS-35]
Blue luminescence of indium doped ZnO thin films prepared by DC magnetron sputtering

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Abstract

ZnO is an intrinsic semiconductor suitable for many optical applications. Homemade dc magnetron sputtering is used to grow indium-doped ZnO (IZO) thin films. The indium content is varied from 0 wt% to 6 wt%. The structure of IZO films are analyzed by X-ray diffraction (XRD), and the optical properties which are carried out using UV-visible and photoluminescence (PL) spectroscopies. The XRD results demonstrated that IZO maintained a hexagonal wurtzite structure with a (002) preferential orientation. The optical bandgap increased with an increase in In-doped concentration. The PL spectrum exhibits a broad blue light emission from IZO centered at 439nm (2,82eV), originating from the radiative recombination at the defect level. Interestingly, the intensity of blue light increased with an increase in In-doped concentration. This IZO films may promise for application to the blue light-emitting devices.

Keywords: Indium doped ZnO, DC magnetron sputtering, and blue luminescence.

[ABS-71]
HEAT TRANSFER ANALYSIS ON THE TOOL OF HEAT EXCHANGER OF PLATE TYPE IN PLTP LAHENDONG UNIT 2

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Abstract

North Sulawesi has a geothermal energy source which is renewable energy and can be used as a geothermal power plant or PLTP. The PLTP is located in Lahendong and is a power plant that is friendly to the surrounding environment because it uses geothermal energy as its resource. In Lahendong PLTP unit 2, there are important component components used to convert steam into electricity, one of which is a heat exchanger. The researcher aims to find out the heat transfer coefficient and the effectiveness of the heat exchanger during commissioning with real time, based on operational data and installation data on heat exchangers in the PLTP Lahendong Unit 2. From this study the results obtained were the highest heat exchange coefficient at commissioning was 107.47 kW / m2. K and the lowest at real time II was 66.93 kW / m2. K. Furthermore, the effectiveness of the highest heat exchanger occurred at commissioning of 51.96% and the lowest at real time II was 37.19%. From the results obtained, the heat exchanger has decreased both in the heat exchange coefficient and the effectiveness of the heat exchanger. The Increase of the effectiveness of the tool of heat exchanger will affect the increase in the heat transfer coefficient on the tool of heat exchanger.

Keywords: Heat Transfer, Heat Exchanger, commissioning with real time

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS (STEM)

[ABS-10]
DEVELOPMENT OF LEARNING DEVICES WITH A PROBLEM BASED MODEL USING PYTHAGORAS PMR THEOREM

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Abstract

This study aims to produce a Mathematics Learning Tool with a Problem-Based Learning Model Using a Realistic Mathematical Approach in the Pythagorean Theorem for eighth grade students of SMP Negeri 1 Tomohon who meet the valid, practical, and effective criteria. This research method is a research on the development of learning tools and evaluation of learning outcomes. The learning tools include the Learning Implementation Plan, Student Worksheets and Evaluation of the learning outcomes of the modified 4-D model of the Pythagorean Theorem. Based on the results of the descriptive analysis, it was found that the development of the Problem Based Learning Model Using the Realistic Mathematical Approach produced good learning tools because it met valid criteria based on expert opinion, the teacher^s ability to carry out learning was good, students were active during the learning process, students gave positive responses to learning, and evaluation of learning outcomes meets the criteria of validity, sensitivity, and reliability. Based on the descriptive analysis at the implementation stage, it was found that the problem-based learning model using a realistic mathematical approach was effective in teaching the Pythagorean Theorem material in class VIII SMP Negeri 1 Tomohon. From the results of the analysis, it can be concluded that: (a) A learning tool has been developed with a Problem Based Learning model using a Realistic Mathematical Approach on the Pythagorean theorem material for grade VIII students of SMP Negeri 1 Tomohon which is found to meet valid, practical, and effective criteria, (b) The validity of the device based on the Problem Based Learning model using the Realistic Mathematical Approach with the validation results of the validators on the device, (c) the practicality of the device based on the Problem Based Learning model with a Realistic Mathematical Approach shown from the results of.

Keywords: Problem Based Learning, Realistic Mathematical Approach, Pythagoras

[ABS-11]
DEVELOPMENT OF MATHEMATIC LEARNING DEVICES USING PROJECT BASED LEARNING ON A FLAT SIDE ROOM

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Abstract

Project based learning is a teaching model that systematically involves students in learning knowledge and skills through a process of inquiry. This study aims to develop learning tools on flat-sided building materials with PjBL in order to produce valid, practical and effective tools. This research includes development research, namely Analysis, Design, Development, Implementation, Evaluation. Based on the validity trial data, the learning tools that have been validated and revised are in the valid category based on the evaluation of the three validators who gave valid statements. There are 5 students who complete the learning process or 83%, so it is stated that the learning tools developed are effectively used in learning. Practical learning devices are in accordance with the responses or responses of all students who are positive and because the three validators state that the tools are practical and can be used. The results obtained can be concluded that the learning device with PjBL on the material of the flat-sided shape that has been developed meets the valid, practical and effective categories so that it is suitable for use.

Keywords: PjBL, Development, Learning tools, Build flat side space

[ABS-12]
DEVELOPMENT OF TWO VARIABLE LINEAR EQUATION SYSTEM LEARNING DEVELOPMENT WITH PROBLEM BASED LEARNING

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Abstract

This study aims to produce a two-variable linear equation system learning tool using the Problem Based Learning model for students of Santa Rosa De Lima Tondano Catholic Middle School. This research method is descriptive method. At the research development stage, the device development model used in this study was a modified 4-D model. The learning tools developed are the Learning Implementation Plan, Student Activity Sheets, and Evaluation of Learning Outcomes. Based on the results of the descriptive analysis, it was found that the development of the Problem Based Learning model of learning produced good learning tools because it met valid criteria based on expert opinion, the ability of teachers to carry out learning was also good, students were active during the learning process, students gave positive responses to learning, and evaluation of results. learning meets the criteria of valid, sensitive, and reliable. Based on the descriptive analysis, it can be concluded: (1) The development research carried out at Santa Rosa De Lima Tondano Catholic Junior High School with the research subjects being students of class VIII in the 2019/2020 school year has produced learning tools that are valid, practical, and effective after being tested and through the process. content validation. The tools developed are the Learning Implementation Plan, Student Worksheets, Evaluation of Learning Outcomes with the Problem Based Learning model on the material of the two-variable linear equation system, (2) validated learning devices produce data with valid criteria, (3) In terms of practicality, the tools learning is in the very practical category according to student responses or responses, and (4) effective learning tools in terms of the Teacher Readiness Level which are in the very good category and the percentage of classical completeness is in the very good classification.

Keywords: Learning, Problem Based Learning, a system of two variable linear equation

[ABS-33]
SEISMICITY OF SUWAWA TIMUR AREA BASED ON ANALYSIS OF EARTHQUAKE THE DEPTH AND MAGNITUDE

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Abstract

North Sulawesi is an area close to the earthquake source due to tectonic processes such as active faults that cause geological phenomena. Generally, earthquakes in Gorontalo that occur in the fault zone are shown on the seismic map. This study aims to determine the seismic in the Suwawa Timur from the earthquake depth and magnitude data. The research location is in Suwawa Timur District, Bone Bolango Regency, Gorontalo. The method used in this study is a qualitative method by collecting data from both related institutions and from previous research results. The analysis was carried out by making a seismic map of the Suwawa Timur area. The map show that the earthquake points in Suwawa Timur are at the depth of shallow earthquakes (0 to 70 km) and medium earthquakes (70 to 300 km). Shallow earthquakes usually originate from active fault movement activity. Suwawa Timur area is dominated by minor earthquakes and mild earthquakes. Lithology condition and Geological structures are affects the magnitude value. Zonation maps relate to the epicenter of the Suwawa Timur . The analysis and discussion carried out in Suwawa Timur concluded the area has shallow earthquake points with a depth (0 to 70 km), and medium earthquakes (70 to 300 km). The magnitude dominated by minor earthquakes with strength (0.0 to 3.9), mild earthquakes with strength (4 to 4.9), and there is one point of moderate earthquake magnitude (5 to 5,9).

Keywords: Earthquake-seismic-Suwawa Timur-Gorontalo

[ABS-45]
ANALYSIS OF ECOTOURISM POTENTIALS OF BOTUTONUO BEACH IN BONE BOLANGO REGENCY GORONTALO PROVINCE

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Abstract

The ecotourism potential of the beach area in Bone Bolango regency, if developed optimally, is very high. Ecotourism development is a tourism activity that incorporates the principles of environment-friendly attitudes. It emphasizes the aspects of nature conservation, empowerment of the local community^s economic, social, and cultural competence, as well as education. Botutonuo beach is among the coastal areas in Bone Bolango regency with high ecotourism potential. The present study aimed to analyze the ecotourism potential of Botutonuo beach based on the physical, sociocultural, economic, and institutional parameters. It employed an ecological-spatial approach by involving the Geographic Information System (GIS). The research method comprised field observation- the data were retrieved by field measurement, interview, and questionnaire. The data were analyzed in a quantitative manner with descriptive statistical analysis, scoring analysis, and qualitative descriptive analysis to result in the final evaluation score of the site^s ecotourism potentials. The analysis result on the site^s physical parameters (vegetation, environmental hygiene, materials, and water brightness) indicated that the Botutonuo beach has high potential. The same criteria were also given in other physical parameters that consisted of distance, facilities, accessibility, and site attractiveness. Moreover, high ecotourism potential was also shown by the site^s other parameters (institutional, sociocultural, economic, and environmental parameters). The site^s high ecotourism potential was due to the beach^s characteristics. The site is a sandy beach that is naturally formed. On top of that, the community^s contribution to constructing tourism facilities was influential in boosting the ecotourism potentials.

Keywords: Ecotourism, Geographic Information System, Botutonuo Beach

[ABS-48]
Assessment of the values of science, education, tourism and the risk degradation of geothermal areas to developing geotourism in the Limboto Lake Plain, Gorontalo

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Abstract

Geothermal areas are unique. Therefore, it can be developed to become a geotourism destination. Limboto Lake plain has geothermal potential which is indicated by the appearance of several points of manifestations. This study aims to assess the value of science, education, tourism and the risk degradation in the geothermal area of the Limboto Lake plain. The method used is the assessment of the value of science, education, tourism and the risk degradation issued by the Geological Agency. The assessment was carried out in two geothermal areas located on the plain of Lake Limboto, namely Geothermal Pentadio and Geothermal Bongongoayu. The results showed that the weighting of the criteria for the values of science, education, tourism and the risk degradation in the Pentadio geothermal area were 73.75%, 73.75%, 75%, 65%, respectively. Weighted criteria for the values of science, education, tourism and the risk degradation in the geothermal area of Bongongoayu are 48.75%, 60%, 58.75%, 62.5%, respectively.

Keywords: Geology- Geotourism- Hotsprings- Manifestation- Geodiversity

[ABS-51]
Geological study of Pantai Indah for geotourism development in the Gorontalo area based on geological observation and assessment of science, education, tourism and the risk degradation

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Abstract

Gorontalo has geological diversity that can be developed for geotourism. One of the tourist destinations of Gorontalo that has geological features is Pantai Indah. This study aims to examine the geological features in the Pantai Indah area based on the assessment of the value of science, education, tourism and the risk degradation. The method used is geological observation and geological feature assessment issued by the Geological Agency. The results showed that the landforms of Pantai Indah were composed of intrusion hills and marine plains. The lithology of the Pantai Indah area is granite and alluvial deposits. There is a geological structure in the form of a normal fault. The weighting of the criteria for the values of science, education, tourism and the risk degradation in the Pantai Indah area is 53.75%, 77.5%, 65%, 76.25%, respectively.

Keywords: Geology- Geotourism- Granite- Normal Fault- Geodiversity

[ABS-58]
Analysis of Fluid Characteristics and Estimation of Geothermal Reservoir Temperature in Kaleosan Area, North Minahasa Regency

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Abstract

Indonesia, which is located in the ring of fire, has abundant geothermal potential. North Sulawesi has geothermal energy with potential resources of 1395 MW and potential reserves of 1513 MW. The appearance of manifestation characterizes the existence of geothermal potential. This research was conducted in the Kaleosan area of North Minahasa Regency which has a manifestation of hot water with a temperature of 90 C with pH of 6.89, and there are silica deposits around it, all of which are characteristics of a water-dominated geothermal reservoir. This research was carried out by analyzing the characteristics of the surface fluid samples of the Kaleosan hot water manifestations. Analysis of fluid characteristics using the Cl-SO4-HCO3, Na-K-Mg, and Cl-Li-B diagrams. From the Cl-SO4-HCO3 diagram, it is found that the geothermal fluid in Kaleosan is a type of chloride. The high chloride content is thought to be due to the increase in geothermal fluids containing CO2 and condensing in shallow aquifers. From the Na-K-Mg diagram, it is obtained that the Kaleosan hot springs are immature water where this manifestation fluid has undergone dilution and cooling by meteoric water during its trip to the surface. From the Cl-Li-B diagram it shows that the hot spring fluid comes from volcano-magmatic origin. For the calculation of reservoir temperature estimates using a silica geothermometer because the fluid is immature water. From the silica geothermometer, the reservoir temperature estimate is 236.6 C, which indicates that the geothermal reservoir in the Kaleosan area is a high enthalpy geothermal system.

Keywords: geothermal- kaleosan- manifestation- reservoir- geothermometer

[ABS-70]
Surface And Subsurface Analysis Based on the Geological Structure and Geolistric Resistivity Data in Gorontalo Outer Ring Road (GORR), Huidu Utara

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Abstract

Gorontalo is one of the areas prone to earthquakes because Gorontalo has a geological structure, which is a fault. This fault has a northwest-southeast direction that cuts across the Gorontalo City area and crosses Lake Limboto. The research objective is to determine the direction of subsurface geological structures and analyze the impact of geological structures on the GORR development infrastructure. The research method is divided into several stages, namely, the preparation phase, the stage of data collection and the stage of data processing and analysis. The preparatory phase includes literature studies and regional geological studies. The next step is data collection in the field including lithology, geomorphology and structural data. And finally, data processing and analysis uses several classifications. Based on surface data, there are several types of lithology such as tuff, clay, and limestone which have started to decay. Geological structure in the form of fault / normal fault with northwest-southeast direction is also found in the study area. Based on subsurface data there are three types of layers namely clay sand, alluvial, and sandstone which are determined based on the classification of rock and mineral resistivity. Subsurface data also shows faults, in the same direction. And based on the vertical resistivity cross section shows the slip area seen from the resistivity value of the layer above it has a lower value than the layer below, it is very possible for landslides because the layer is more easily eroded and flowed, plus supported by a fairly steep field and rainfall in the GORR Region high enough.

Keywords: Tuff, Clay, Normal Fault, Resistivity, Electrical.

[ABS-74]
Lithostratigraphy of sedimentary rocks in the Tudi area, Monano sub-district, North Gorontalo District, Gorontalo Province

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Abstract

Based on the tectonic order, the research area is one of the regions that has complex geological conditions so that it becomes one of the attractions in conducting research on Geology, specifically on Sedimentology and Stratigraphy. Geographically the location of the study is at coordinates N 00049^22,52 ^., E 122041^47.64^. And administratively located in Tudi Village, Monano Sub-District, North Gorontalo District, Gorontalo Province. The purpose of this research is to find out lithostratigraphic sedimentary rock in the study area and to interpret the formation environment. The method used in this research is the preparation stage, literature study, field data collection in the form of lithology / lithostratigraphic data, data processing and analysis of field data conducted in the laboratory, and finally the writing of the results of the study accompanied by stratigraphic cross section. Based on field data collection and analysis on stratigraphic sections, lithostratigraphic analysis results obtained in the study area consisted of conglomerate units, conglomerate sandstone units and sandstone units which generally formed vertically normal graded patterns towards younger rocks with a relative position to the north. For the interpretation of the depositional environment based on the characteristics of the lithology formed, the pattern of sediment deposition / bedding and sedimentary structures observed were only parallel laminations. So in the study area shows the characteristics of the system fluvial environment, namely channel fill deposit and Overbank.

Keywords: Lithostratigraphy, Fluvial System, Gorontalo region.