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Proceedings of the International Conference on Science and Technology (ICST 2018)

The International Conference on Science and Technology (ICST) was held at the Bali Nusa Dua Convention Center, 18-19 October 2018. This conference is an international platform for scholars, researchers, practitioners, and government officials to discuss interdisciplinary research and practices.

Please click here for the conference website. *(Conference website no longer available.)*

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Proceedings of the International Conference on Science and Technology (ICST 2018)

The Organizing Committee of ICST 2018 is proud to present the proceedings of the International Conference on Science and Technology (ICST 2018: https://www.bali-icst.org/), held on October 18-19, 2018 in Bali, Indonesia. The theme of this conference is Science, Technology, Innovation, and Education for Sustainable Development to Support Community Empowerment.

This conference is an international platform for scholars, researchers, practitioners, and government officials to discuss interdisciplinary research and practices.

ICST 2018 has received more than 300 manuscripts. And 229 submissions

have been accepted by our reviewers. By submitting a paper to ICST 2018, the authors agree to the review process and understand that papers undergo a peer-review process. Appropriately qualified experts have reviewed manuscripts in the field selected by the Conference Committee, who gave detailed comments and if the submission gets accepted-the authors to submit a revised version that takes into account this feedback. The Committees of ICST 2018 invest significant efforts in reviewing the papers presented to the conference and organizing the sessions to enable the participants to gain maximum benefit.

Finally, we would like to thanks all the authors, speakers, and participants of this conference for taking part in and contributing to the International Conference on Science and Technology. (@ICST 2018 Organizing Committee).

October 18 to 19, 2018
With our warmest regards,

Madlazim

Conference General Chairs
Bali, Indonesia

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Proceedings of the International Conference on Science and Technology (ICST 2018)

822 authors

Abadi, Abadi
Dynamics and Numerical Simulation of Stage Structure Prey-Predator Models

Abdullah, Saiful Do.
Utilization of NVIS HF Radio As Alternative Technologies In Rural Area of North Maluku

Abdurrachman, Nursanti
Underwater Image Correction Using Bilateral Filter

Abidin, Zainal
Reviewing Government Policy on Rice Price: Study Through Rice Price In East Java

Market

Adam, Alif Syaiful
The Comparison of Gravitational Acceleration through Optical Sensor and Receptor Pad Apparatus

Adam, Alif Syaiful
The Comparison of Static Friction Coefficient on Wood Between the Combination of Wood-Metal Load System and Wood-Sand Load System

Aditiawan, Firza Prima
Evaluation of Maturity Level Information System And Technology Using Cobit 4.1 (Case Study Diskominfo East Java Province)

Admoko, Setyo
Analysis of College Students' Misconception on Geometrical Optics

Afandi, Mohamad Irwan
Prototype of Voice Commanded University Executive Business Intelligence Assistant (BELA)

Afandi, Mohamad Irwan
IoT-based Intelligent Fishcarelab System (IFS) for Koi Fish Monitoring System

Afiadi, Fitri
Earthquake Prediction System using Neuro-Fuzzy and Extreme Learning Machine

Agrita, Inka
Glycemic Index of Snack Bar from Pedada Fruit Flours (Sonneratia caseolaris) and Legumes Flour

Agustan, Agustan
Study on Compressive Strength of Sarmayam Clay Stabilized with Cement and Polypropylene Fiber

Agustiono, Wahyudi
An Open Source Software Quality Model and Its Applicability for Assessing E-commerce Content Management Systems

Ahadian, Edward Rizky
Roadworthiness Test For Traffic Safety

Ahadian, Edward Rizky
Solid Waste Management: Mapping of Temporary Waste Sites and Potential Wild Solid Waste in Ternate City

Aisiah, Siti
Taxa composition of Insects in Peat Agricultural area Kalampangan sub-district Central Kalimantan Indonesia

Akbar, Fawwaz Ali
Analysis of Simple Data Imputation in Disease Dataset

Akbar, Fawwaz Ali
Detection of Indonesian Vehicle Plate Location using Harris Corner Feature Detector Method

Akhmad, Sabarudin
Development of Hot Press Molding for HDPE Recycling and Process Characterization

Akhmad, Sabarudin
Dehumdifier Heat Pump Dryer for Corn Drying and Process Characterization

Alahudin, Muchlis
The Effect of Using Innovative Furniture on Space Circulation in Lease Houses in Merauke

Alfita, Riza
Cow Weight Estimation Using Local Adaptive Thresholding Method And Connected Component Labelling

Alfita, Riza
Effect of Tower Construction Analysis Against Reliability Level of SUTET 500kV to Lightning Strike

Alfita, Riza
Implementation 4 – DoF Arm Robot Object Sorting Controlled Based On Color Using Inverse Kinemathics Algorithm

Alfita, Riza
Designing and Implementing Trajectory Planning and Inverse Kinematics Algorithms

using Hexapod Robot Platform

Alfita, Riza

Designing Magnetic Stirrer Hot Plate Using Contactless Infrared MLX90614 Temperature Sensor Based On PID Controller

Alit, Ronggo

Training Algorithm for Dendrite Morphological Neural Network Using K-Medoids

Alit, Ronggo

Implementation of Constraint Satisfaction Problem Methods on Course Scheduling in High School

Alit, Ronggo

Implementation System Telegram Bot for Monitoring Linux Server

Alit, Ronggo

Evaluation of Information Technology Infrastructure Management using IT Balanced Scorecard and COBIT Framework 4.1 on Domain Deliver and Support

Amalia, Aussie

Cr (VI) Removal Using Cow Bone Waste Adsorbent

Amalia, Aussie

Modeling of Isoterm Phosphate Adsorption in Laundry Wastewater Using Anion Resin

Amir, Indra Tjahaja

The Impact of Excise Tariffs on The Performance of White Cigarette Industry

Anakottapary, Daud S.

Heat Transfer Study on Fan Coil Unit Of Water Chiller With Nanofluid Al2O3 as Chilled Water

Anamisa, Devie Rosa

Automatic Application Of Graphic Design To Banner Model

Andayani, K Wiwin

Identification and Mitigation of Waste Construction Project Material (Case Study of Building Projects in Badung Regency)

Andika, Puma Manggala Virga

Usage Of Zeolite And Chitosan Composites As Slow Release Fertilizer

Anggarani, Mirwa Adiprahara
Analysis of Contaminant and Nutritional Content of Red Galangal (Alpinia purpurata K. Schaum) Simplicia

Anggoro, Paulus Wisnu
The Evaluation of the Use of AFO (Ankle Foot Orthotics) with the MOXFQ (Manchester-Oxford Foot Questionnaire) Method

Anggraeny, Fetty Tri
Replies Identification in Question Answering System using Vector Space Model

Anggraeny, Fetty Tri
Analysis of Simple Data Imputation in Disease Dataset

Anggraeny, Fetty Tri
Evaluation of Maturity Level Information System And Technology Using Cobit 4.1 (Case Study Diskominfo East Java Province)

Anggraini, Nuricha
Capacitance Stability of Supercapacitor

Anggreini, Riski Ayu
Characteristics of Dried Noodles from Modified Sorghum Flour (MOSOF) (Sorghum bicolor)

Angkoso, Cucun Very
Developing A-Freemium Mobile Games Software Based On Augmented Reality-Commerce

Anifah, Lilik
Automatic Liquefied Petroleum Gas Leakage Control System Using Proportional Integral Derivative (PID) Proportional

Anna, Ika Deefi
Multi-objective Linear Programming for Supplier Selection and Order Allocation of Raw Material

Annisa, Rullie
Analysis of the Working Position of Sandal Operator Using RULA and REBA Approach at Sisman Corporation (SISCO)

Anshori, Nachnul
Optimizing Process Parameter Machining From Combined Energy Consumption and Material Removal Rate On ST 41-3

Anugrah, Dedi
Decision Support System: A Prototype for Determining Rice Price Based on Its Quality Measurement

Arafah, Kaharuddin
Implementation of Basic Physics I Computer-Based Teaching Material on Physics Education Students of Masamus University Animation Teaching Material of Basic Physics I

Arendra, Anis
Development of Hot Press Molding for HDPE Recycling and Process Characterization

Arendra, Anis
Dehumdifier Heat Pump Dryer for Corn Drying and Process Characterization

Arief, Assaf
Utilization of NVIS HF Radio As Alternative Technologies In Rural Area of North Maluku

Arief, Muhammad Rendy
Evaluation of Maturity Level Information System And Technology Using Cobit 4.1 (Case Study Diskominfo East Java Province)

Arsana, Made Ery
Comparative Analysis of Performance between Two Phase Ejector with Accomulator and COS Split Air-Conditioning Dual Evaporator

Arsawan, I Made
Air Distribution Analysis in Drying Tumpeng Process with Dry Racking Machine Type

Arsyad, Muhammad
Implementation of Basic Physics I Computer-Based Teaching Material on Physics Education Students of Masamus University Animation Teaching Material of Basic Physics I

Arya, I Wayan

Correlation of Embankment Density Degree with Slopes Landslides Safety Factor

Aryanto, Komang Agus Ady
IoT-based Drip Irrigation Monitoring and Controlling System using NodeMCU and Raspberry Pi

Asnawi, Asnawi
Low-cost fabrication of optical waveguide as directional coupler using CO2 laser cutting

Asri, Mahanani Tri
Soil Physic and Chemistry Characteristics on Pesticide Application of Soybean Land in Jombang, Lamongan and Probolinggo

Asri, Sri Andriati
CNN and SVM Based Classifier Comparation to Detect Lung Nodule In Computed Tomography Images

Asri, Sri Andriati
Comparing Traditional and Agile Software Development Approaches: Case of Personal Extreme Programming

Assagaf, Achmad Fuad
Clustering of Potency of Shrimp In Indonesia With K-Means Algorithm And Validation of Davies-Bouldin Index

Astawa, I Nyoman Gede Arya
Robust License Plate Detection using Convolutional Neural Network

Astuti, Yuliani Puji
The Control Design for Trajectory Tracking of Four-wheeled Mobile Robot using Model Predictive Control: A Preliminary Study

Astutik, Heni
The Influence of Node Velocity and Traffic Congestion on The Performance of AODV in MANET

As'ari, Abdur Rahman
Facilitating Classroom Discussion In Mathematics Instruction To Promote Students' Understanding

Atmaja, I Made Ari Dwi Suta
Robust License Plate Detection using Convolutional Neural Network

Atmaja, Pratama Wirya
Evaluation of Maturity Level Information System And Technology Using Cobit 4.1 (Case Study Diskominfo East Java Province)

Atmaja, Pratama Wirya
Rizubot Version 1.0 algorithm: How to read the price movements of Crypto Currency Using the API to find a good purchase price

Atmaja, Pratama Wirya
Generating Two-Dimensional Platformer Game Levels from Storylines

Awaludin, Rabial
Application of Pavement Condition Index (PCI) on The Assessment of The Kalumata – Fitu Highway Section of Southern of Ternate City

Azizah, Silviana Nur
Design Of Modified Microstrip Antenna And 4x1 Microstrip Array For Data Communication At 2.4 GHz Frequency

Azizah, Utiya
Scientific Thinking Skills: Why Junior High School Science Teachers Cannot Use Discovery and Inquiry Models In Classroom

Bahri, Syamsul
Production and Characterization of Mechanical Properties of Sago Pulp Composite Board

Bahri, Syamsul
Implementation of Basic Physics I Computer-Based Teaching Material on Physics Education Students of Masamus University Animation Teaching Material of Basic Physics I

Bahroni, M. Izar
AUTONOMOUS QUADCOPTER STABILITY WITH PID CONTROL

Baktir, Afaf
Clinical Test of Nanogold-Nanoseaweed Cosmetics For User Cosmetic Sociaty

Banggu, Ilham
The Effects Of Volcanic Ash On The Strength And Permeability Mortar

Bangsa, Ketut
Air Distribution Analysis in Drying Tumpeng Process with Dry Racking Machine Type

Bashri, Ahmad
Curriculum Implementation in Biology Program of Universitas Negeri Surabaya

Basith, Musa Abdul
Effect of Tower Construction Analysis Against Reliability Level of SUTET 500kV to Lightning Strike

Basri, Ardi
Spatial and Environmental Condition of Bajo Tribe Settlement in South Halmahera

Bawono, Bayu
The Evaluation of the Use of AFO (Ankle Foot Orthotics) with the MOXFQ (Manchester-Oxford Foot Questionnaire) Method

Bayuseno, A.P.
Modeling and Optimization of Struvite Crystal Scaling Using Experimental Design Methodology For Maleic Acid

Bayuseno, A.P.
The Evaluation of the Use of AFO (Ankle Foot Orthotics) with the MOXFQ (Manchester-Oxford Foot Questionnaire) Method

Betaubun, Herbin Florensius
Analysis of the Effects of Traffic Volume on the Pavement Condition in the Educational Zone of Merauke Regency

Betaubun, Philipus
Study on Compressive Strength of Sarmayam Clay Stabilized with Cement and Polypropylene Fiber

Budiarto, Hairil
Prototype of Heat Exchanger U-Tube Model Shell and Tube Counter Flow

Budijastuti, Widowati
Specific Oxygen Reaction through analysis of Malondialdehyde in the body of

Methapire postuma

Budiyanto, Mohammad
Efficiency of Optical Sensors with Quasi Gaussian Beam for Determining Cholesterol Concentration

Bussafi, Mukhib
Optimizing Process Parameter Machining From Combined Energy Consumption and Material Removal Rate On ST 41-3

Buyang, Yorinda
Adsorption of [AuCl4]- on Iron Sand Magnetic Material Coated with Aminobezimidazol Modified Silica

Buyang, Yorinda
Phytochemical Screening of Ant Plant Myrmecodia rumphii Becc.

Buyang, Yorinda
Formulation Syrup of Extract of Sarang Semut Plant (Myrmecodia rumphii Becc.) From Merauke

Cahya, Kiki Indra
Decreasing Organic Containers in Slaughterhouse with Photocatalyst Method using TiO2 and UV-C Rays

Cahyanti, Theresia Widi Asih
Analysis of the Effects of Traffic Volume on the Pavement Condition in the Educational Zone of Merauke Regency

1 2 3 4 5 ... 9 >

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229 articles

Proceedings Article

Decision Support System: A Prototype for Determining Rice Price Based on Its Quality Measurement

Rizka Hadiwiyanti, Prisa Marga Kusumantara, Dedi Anugrah, Tri Lathif MS

Quality measurement of rice is an important and necessary activity before it is sold to market. By distinguishing its quality, pricing will also be suitable by the physical characteristics of rice delivered by farmers. This paper proposed a prototype of DSS application to assist intermediaries in determining...

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Prototype of Voice Commanded University Executive Business Intelligence Assistant (BELA)

Mohamad Irwan Afandi, Eka Dyar Wahyuni

Higher education institutions have already started implementing business intelligence application in order to support university executives to make better decisions. Normally, an application is operated using a mouse, keyboard, or touch-screen device which in some cases is not suitable for the users....

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Unsupervised Image Segmentation Algorithm using Superpixel and Cosine Similarity

Wahyu S J Saputra, C Aji Putra, Yisti Vita Via

In computer vision, image segmentation is a process of dividing image to get several segments of image. Image segmentation aim to divide image into simple section that meaningful and easy to analyze. Image segmentation

regularly use to locate boundary of object in image, so object in image can analyzed....

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Optimization of Student Interest Selection Using Artificial Neural Network and Rete Network

M. Syahrul Munir, Eva Y Puspaningrum, Dimas Eko Wicaksono

The need for a prospective student to know the interest of the field of study at the college according to his intelligence becomes one of the complex problems. The selection of the right field of study makes the prospective students more enthusiastic to attend college and graduate on time. Therefore...

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The Robust Regression Performance for Face Recognition with Lighting Condition Variation of Training Data

Budi Nugroho, Anny Yuniarti

In this research, the Robust Regression method used for face recognition tested its performance with illumination variations on the training dataset. Experiments were carried out using Cropped Yale Face Database B. By using this standard face database, generally the data for the training process used...

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IoT-based Intelligent Fishcarelab System (IFS) for Koi Fish Monitoring System

Minto Waluyo, Basuki Rahmat, Tuhu Agung Rachmanto, Mohamad Irwan Afandi, Helmy Widyantara, Harianto Harianto

Internet of Things (IoT) allows connections between devices using an internet connection with the ability to collect and exchange data. This research utilizes the IoT network to monitor the growth of koi fish in the pond. By utilizing the NodeMCU microcontroller, temperature and pH sensors, the sensor...

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CNN and SVM Based Classifier Comparation to Detect Lung Nodule In Computed Tomography Images

I Wayan Budi Sentana, Sri Andriati Asri, Naser Jawas, Anggun Esti Wardani

Convolutional Neural Networks (CNN) are biologically-inspired variants of Multiple Layer Perceptron (MLPs). Meanwhile, support vector machines (SVMs) are supervised learning models with associated learning algorithms that analyze data used for classification and regression analysis. In some research...

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Hydrolysis of Glucose from Bamboo with Micro Controller PID type Arduino UNO and Fuzzy Method

Ni Ketut Sari, Dira Ernawati, Intan Yuniar Purbasari, Basuki Rahmat

Glucose needs each year has increased significantly while glucose production has decreased, this is because supplies of the raw materials limited, where bamboo is one of the raw material alternatives to glucose. The selection of bamboo plants based on levels of cellulose which ranges from 42.4%-53.6%,...

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Making Bioetanol from Glucose Off Grade With Fermentation Process Using Fermiol

Ni Ketut Sari, Khurniawati Khurniawati, Uman Fathoni, Widi Wurjani

Fermentation can be defined as a process of anaerobic oxidation of carbohydrate which produces alcohol and carbon dioxide. Batch fermentation is fermentation system closed, where there is no addition of new media, there are no additions (O2), antifoam, acid/alkaline pH control is done in a way. the fermentation...

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Optimization of Slice Thickness, Drying Method, and Temperature of Turmeric Rhizome (Curcuma Longa L.) Based on Water Content and Functional Compound Degradation

Pirim Setiarso, Nita Kusumawati, Rusijono Rusijono, Supari Muslim

The research of oven-based drying technology on the production process of turmeric rhizome (Curcuma Longa L.) with thickness 0.15 and 0.30 cm have been. A number of parameters, such as slicing thickness, drying methods and temperatures are optimized, to achieve water and functional compounds (essential...

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Impact of Lapindo Hot Mud Flowing on Macrozoobenthos Communities in Estuary Porong, East Java

Tarzan Purnomo, Fida Rachmadiarti, Soegiyanto Soegiyanto

Estuary Porong is part of the east coast of Sidoarjo, East Java, which receives the Lapindo mudflow. Lapindo mudflow into the sea through the Porong river has caused sedimentation and changed the Porong river base substrate morphology so that it affects the organism that live in the estuary, especially...

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Specific Oxygen Reaction through analysis of Malondialdehyde in the body of Methapire postuma

Widowati Budijastuti, Nur Ducha, Dyah Hariyani, Sunu Kuntjoro

The purpose of this study was to evaluate the specific oxygen reaction on the body of Methapire postuma worms found in Pb metal contaminated areas. This study uses exploration methods with selected samples in Bangkalan. The body of the worm was cut off on the spermateka, vesicles and prostate sections...

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The Morphological, Anatomical, And Physiological Characteristics of Elephantopus scaber As Explant Source For Tissue Culture

Yuliani Yuliani, Sari Kusuma Dewi, Fida Rachmadiarti

The purpose of this study was to describe morphological characteristic (leaf area, plant height, and leaf sheath), to describe anatomical characteristic (trichomes found in leaf sheath, veins, leaf blade and stem, to describe the physiological characteristic from phytochemical tests of secondary metabolites...

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Enhancing Problem Solving Skills of Pre-Service Teachers by Integrating 21st Century Interdisciplinary Theme Into Science Class

Dhita Ayu Permata Sari, Wahono Widodo, Elok Sudibyo

Mastery of key academic subjects in school is not enough to succeed in the 21st century. Some specific skills, such as problem-solving, is needed. On the other hand, it is also important to foster understanding of academic content at much higher level by relating 21st-century interdisciplinary theme,...

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Efficiency of Optical Sensors with Quasi Gaussian Beam for Determining Cholesterol Concentration

Mohammad Budiyanto, Suhariningsih Suhariningsih, Moh Yasin

Research on fiber optic sensors with Quasi Gaussian beam has been carried out aiming to analyze the beam intensity profile of the light beam, sensor performance and sensor sensitivity to determine cholesterol concentration. The concept of laser beam propagation is guided by an optical fiber bundle in...

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Exploring Pre-service Science Teachers' Capabilities in

Competing for National Scientific Fair through SETS Learning

Aris Rudi Purnomo, Martini Martini, Laily Rosdiana, Wahyu Budi Sabtiawan, Hasan Subekti

To participate in the National Scientific Fair, pre-service science teachers (PSTs) need to prepare their capabilities in the competition. This study used survey to explore the capabilities of PSTs in terms of preparing scientific proposal, assessing proposal format and surveying PSTs perception. Rubric...

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Soil Physic and Chemistry Characteristics on Pesticide Application of Soybean Land in Jombang, Lamongan and Probolinggo

Mahanani Tri Asri, Tarzan Purnomo, Yuliani Yuliani, Fida Rachmadiarti, Evie Ratnasari

Applications of pesticides on crop land have been used by soybean land farmer in Jombang, Lamongan and Probolinggo in order to control pest. Pesticide application of soybean land influence physic and chemistry soil, against growth of plant furthermore. This study aimed to identify soil physic and chemistry...

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Study of Kana (Canna sp) and Butterfly (Bauhinia purpurea) Plants as Leading Absorbents (Pb)

Sunu Kuntjoro, Fida Rachmadiarti

According to the Environment Project Agency (2007), about 25% of lead (Pb) remains in the engine and the other 75% will pollute the air as exhaust fumes. Kana (Cana sp) and Butterfly plant (Bahuinia purpurea) are plants that are suitable for the needs of urban forest plants. Studies related to the potential...

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Curriculum Implementation in Biology Program of Universitas Negeri Surabaya

Ahmad Bashri, Rinie Pratiwi Puspitawati, Muslimin Ibrahim

This study aims to describe the effectiveness of curriculum implementation in the Biology Program, implementation of curriculum implementation in the Biology Program, and obstacles in implementing the curriculum. This research is an observational study, which observes curriculum documents and their implementation....

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Azolla microphylla and Pistia stratiotes as Phytoremediator of Pb (lead)

Fida Rachmadiarti, Herlina Fitrihidajati, Tarzan Purnomo, Yuliani Yuliani, Dwi Asih Wahyuningsih

Azolla microphylla and Pistia stratiotes were type of plants which used as alternative to remove pollutant from contaminated water. This study aimed to

determine efficiency of Azolla microphylla and Pistia stratiotes as phytoremediator of Pb. These plants were grown in 14 days under hydroponic system...

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Characterization of Microorganism Isolated From "Fermege": The Ruminant Fermented Feed from Water Hyacinth (Eichhornia crassipes)

Isnawati Isnawati, Guntur Trimulyono

The aim of this study was to determine the number of bacteria and fungi in the fermentation process and characterization of these microorganisms. There were several steps in this research including production of fermented feed, isolation of indigenous microorganisms, purification, characterization of...

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Improving the Quality of Goat Sperm through the Implementation of Fermented Feed based on Water Hyacinth: Fermege Formula 3

Evie Ratnasari, Herlina Fitrihidajati, Isnawati Isnawati

Fermented feed made from water hyacinth contain high nutrition, increase goat weight, improve carcass quality and improve the reproduction system of goats. The aims of this study were determining the effect of fermege formula 3

on the quality of goat spermatozoa was compared to conventional feed. This...

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Improving the Quality of Tofu Liquid waste by the Sedimentation Process and the Phytoremediation of Water Hyacinth (Eichornia crassipes)

Herlina Fitrihidajati, Fida Rachmadiarti, Dwi Savitri Vidyawati

Waste from the tofu industry produced the pollutant like NH3, NO2, NO3 with high content that caused environmental pollution. Hence, the processing of tofu liquid waste was needed. The purpose of this research was to determine the effect on the levels of pH, NH3, NO2, NO3 and to determine the biomass...

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Glycemic Index of Snack Bar from Pedada Fruit Flours (Sonneratia caseolaris) and Legumes Flour

Jariyah Jariyah, Sri Winarti, Inka Agrita

Snack bar is a snack in the form of bars made from cereals or nuts, has a high protein content which is usually consumed on the sidelines of meals. Pedada fruit is one of the mangrove fruits that contain high dietary fiber, while the legumes a good source of protein, and it also contains carbohydrates,...

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Decreasing Organic Containers in Slaughterhouse with Photocatalyst Method using TiO2 and UV-C Rays

Okik Hendriyanto Cahyonugroho, Kiki Indra Cahya, Agil Harnowo Putra

The slaughterhouse waste generally contains blood, protein, grease and suspended solids which cause the burden of high organic materials that can contaminate the rivers and environment. Therefore, efforts should be made before the waste with this high organic content in order not to pollute the environment....

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Performance of Algae Reactor for Nutrient and Organic Compound Removal

Agil Harnowo Putra, Aulia Ulfah Farahdiba

The excess content of nutrients in the water can cause eutrophication which has an impact on increasing turbidity and causing anoxic conditions in a waters. High Rate Algae Reactor (HRAR) is wastewater treatment and nutrient recycling based on symbiotic interactions between heterotropic bacteria and...

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Encapsulation and Germination of Synthetic Seeds of Chrysanthemum

Pangesti Nugrahani, Ida Retno Moeljani, Irda Lydiana

Chrysanthemum is one of the most important Indonesia flowers, that which has always been developed in various plant breeding studies, including the development of synthetic seed encapsulation methods. Encapsulation is a technology on enclosed any meristematic plant tissue in a protective and nutritive...

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Physical and Chemical Properties of Silver Rasbora Bekasam Using Various Types of Processed Rice as Fermentation Media

Anugerah Dany Priyanto, Sri Djajati

The most frequent problem in increasing demand of fishery products is rapidly quality decline of fresh products. Therefore, obligatory right handling is required to maintain the fish quality. Aims of this study was to determine the type of processed rice as fermentation media in silver rasbora bekasam...

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Proportion Study of Wheat Flour and Purple Yam Flour and Addition of Egg on Making of Dry Noodle

Enny Karti Basuki Susiloningsih, Rosida Rosida, Ariska Febrianita

The purpose of this study was to determine the effect of the proportion of wheat flour: purple yam flour and egg addition on the quality of dried noodles produced. This study used a completely randomized design factorial pattern

with 2 factors, namely the proportion of wheat flour and purple yam flour...

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Characteristics of Dried Noodles from Modified Sorghum Flour (MOSOF) (Sorghum bicolor)

Riski Ayu Anggreini, Ulya Sarofa, Rosida Rosida

Consumption of noodles in Indonesia is increasing and this has an impact on increasing imports of wheat flour. Sorghum is considered to have the potential to be used as a substitute for wheat flour, because it has a fairly good nutrient content. However, it has anti-nutritional properties which can reduce...

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Design of Automatic Harvest System Monitoring for Oyster Mushroom Using Image Processing

Diana Rahmawati, A. Fiqhi Ibadillah, Miftachul Ulum, Heri Setiawan

The aim of this study is designing a system which can automatically detects the harvest time of the plant, using data from camera, using image processing. Phase one of our project depends on designing a harvest time decision maker system using image processing. Phase 1, plant grown using Smart greenhouse...

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Cow Weight Estimation Using Local Adaptive Thresholding Method And Connected Component Labelling

Rosida Vivin Nahari, Novita Subagiarti, Achmad Jauhari, Riza Alfita, Kunto Aji Wibisono, Achmad Fiqhi Ibadillah, Mirza Pramudia

The development of technology, information and communication provides a new alternative to predict cow weight through Image Processing. This study utilizes Image Processing in visualizing the measurement of Chest Circumference and cow body length automatically. The cow weight estimation are very dependent...

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The Association Rule of Corn Disease Symptoms by Using Frequent Pattern Growth and Random Forest

Achmad Yasid, Budi Dwi Satoto

Despite proper soil health management, pests and diseases control is also an important task in corn farming for improving both the quality and the quality of the crops production. One way to address this challenge is to identify the emerging symptoms accurately to help define the appropriate solution....

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Effectiveness of Moringa Oleifera Seed as Phytocoagulant in Wastewater Treatment of Batik Industry

Erina Rahmadyanti, Elizabeth Titiek Winanti, Indiah Kustini

Test results with SEM-EDX show that the deposition time affects the copper content of the MWCNT. With a deposition time of 15, 30 and 60 minutes, copper content was 1.141 %, 3.227 % and 33.56 % by weight. The XRD test results showed that with 15 minutes deposition time, there was 97 % MWCNT and 3 % copper...

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Taxa composition of Insects in Peat Agricultural area Kalampangan sub-district Central Kalimantan Indonesia

Adventus Panda, Siti Aisiah, Kornelia Marlina Sosiayu, Rotua Novera Simbolon, Agus Haryono

Insects are one of taxa within Animal. Despite of their high adaptability, this group also cover vast areas. Nevertheless, they are played an ecological role. This is suggest, that this taxa having a sizable proportion over animal kingdom. Data from agricultural area, their existence most often reported...

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Albumin, Globulin Concentration and Total Protein Colostrum Mother Pig Superovulation before Breeding

Revolson A Mege, Nonny Manampiring, Debbie J. J. Rayer, Friska M. Montolalu

This research aimed to study the effect of PMSG and hCG injection breeding albumin, globulin concentration and total protein colostrum mother of pig. This research using 6 months piggy descent of land care with 30 pigs total and the weight average 95-105 kg. Hormone in used are MPSG and hCG before breeding...

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The Effect of Stirring Time and Cast Thickness on Morphology, Permeability, and Thermal Stability of Polysulfone/Polyvinylidene Fluoride Blended Membranes

Pirim Setiarso, Nita Kusumawati, Supari Muslim, Maria Monica Sianita, Ruwanti Dewi Cahya Ningrum

Polysulfone/Polyvinylidene fluoride blend (PSf/PVDF) membranes with composition PSf/PVDF/NMP/NH4Cl (wt.%) of 8/6/84/2 supported on gauze

fabric were successfully synthesized by a phase inversion method and immersion precipitation technique. Variations of stirring time and cast thickness were used to...

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Usage Of Zeolite And Chitosan Composites As Slow Release Fertilizer

Dina Kartika Maharani, Kusumawati Dwiningsih, Raisza Tarida Savana, Puma Manggala Virga Andika

The research with the title usage of zeolite and chitosan composites as slow release fertilizer had been done. In this research, fertilizer was made by mixing zeolite with NaNO3 as a source of macro nutrients (nitrogen) and chitosan as a crosslinks which will later be used to provide slow release function...

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Antioxidant Activity of Palmitic Acid And Pinostrobin From Methanol Extract Of Syzygium litoralle (Myrtaceae)

Nurul Hidajati, Tukiran Tukiran, Dian Arista Setiabudi, Andika Pramudya Wardana

This study presents a research of klampok watu plant (Syzygium littorale) including the Myrtaceae family. As far, only a few report about Syzygium littorale in leaves, fruit, stem bark or other parts. The stem bark of plant was extracted with an organic solvent and then fractionated (isolated) using...

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PROFILE OF THE ACADEMIC COMPETENCY OF CHEMISTRY EDUCATION STUDENTS

Bertha Yonata, Wasis Wasis, Raden Sulaiman, Elok Sudibyo, Muji Sri Prastiwi

This article reports the results of a limited trial on the academic competence of students in chemical education. This limited trial also measured the level of student confidence and the truth of chemical concepts from a sample of 24 class 2014 chemistry education students who would and were taking thesis...

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A Real-Time System for Monitoring Methane Level in Biogas Production A Preliminary Study

Meta Yantidewi, Utama Alan Deta, Nurita Apridiana Lestari

Methane is one of the flammable natural gas that can be found in biogas. Because of its flammable property, methane is mostly used as fuel. This research designed a monitoring system that can monitor the methane concentration level. The instrument system consisted of a methane gas sensor as a gas detector,...

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A Preliminary Design: "assessment as learning" to accelerate students' achievements

Wahyu Budi Sabtiawan, Elok Sudibyo, Tutut Nurita

Assessment is a part of educational process. One of the assessment roles is "assessment as learning" (AaL). The study aims to introduce a preliminary design for implementing AaL. The research, as developmental research, has been in a design step. The design was developed based on the genetic of AaL viewing...

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Scientific Thinking Skills: Why Junior High School Science Teachers Cannot Use Discovery and Inquiry Models In Classroom

Erman Erman, Wasis Wasis, Endang Susantini, Utiya Azizah

This study aims to describe the difficulty of the teacher in distinguishing the implementation of discovery and inquiry learning models in science learning and the factors that led to the scientific thinking skills of junior high school science teachers. The case study design used in this study involved...

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Analysis of Contaminant and Nutritional Content of Red Galangal (Alpinia purpurata K. Schaum) Simplicia

Mirwa Adiprahara Anggarani, Nita Kusumawati, Roy Januardi Irawan,

Rusijono Rusijono

This study has been conducted analysis of contaminant and nutritional content of red galangal (Alpinia purpurata K. Schaum) simplicia. Simplicias as one of post-harvest processed form. Simplicia is a material to produce herbs medicine. So that, simplicia quality must be considered. The quality of simplicias...

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Implementation of learning model map concept with inquiry strategy in an effort to train high-order thinking skills of chemistry education students

Ismono Ismono, Sri Poedjiastoeti, Suyatno Sutoyo

Higher order thinking skills (HOTs) are needed by the students of chemistry education, because they will become teachers who will be able to teach HOTs to the This research is the application of concept map learning models with inquiry strategies to train higher order thinking skills of chemical education...

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The Implementation of Interactive Multimedia and Kits on Food Topic to Facilitate Chemical Students with Hearing Impairment

Dian Novita, Sri Poedjiastoeti, Sukarmin Sukarmin, Achmad Lutfi

The research aimed to describe the implementation of interactive multimedia

and kits to facilitate students with hearing impairment. The kit consists of student activity sheet, tools, and materials for experiment. Student activity sheet of chemistry on foods consists of five experimental titles. The...

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Tracing Individual Conception in Conceptual Change Stages Using Module Assistance

Suyono Suyono, Wahyu Budi Sabtiawan, Wike Kusuma Wardani

misconceptions have been the problem in educational field until now days. Tracing them will be an important part to solve the problems. The study aims to trace the individual conception using module assistance. The method was implementing a module of M3CGK containing conceptual change strategic to 16...

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Cr (VI) Removal Using Cow Bone Waste Adsorbent

Raden Kokoh Haryo Putro, Vansa Nopy Rahardi, Okik Hendriyanto Cahyonugroho, Aussie Amalia

Pollution caused by Cr(VI) metal is harmful because it is toxic and carcinogenic. Utilization of cow bone waste is considered not optimal. One of the utilization is as an adsorbent of Cr(VI) metal. This research aims to determine the adsorption capacity by bone waste bone adsorbent in lowered Cr(VI)...

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Modeling of Isoterm Phosphate Adsorption in Laundry Wastewater Using Anion Resin

Aussie Amalia, Pritho Ajeng Maharani, Euis Nurul Hidayah, Raden Kokoh Haryo Putro

The excess content of phosphate in laundry wastewater can cause eutrophication. Ion exchange is a method that has been widely used to remove pollutants in wastewater. The study of ion exchange equilibrium is generally carried out by means of adsorption isotherms modelling. The use of adsorption isotherms...

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Effect of Acid Type on Si-K-HAs Gel Characterization

Srie Muljani, Bambang Wahyudi

The effect of both citric acid and hydrochloric acid on the Si-K-HAs gel characterization was studied with various pH gelation. The Si-K-HAs gel obtained from acidification of the mixture of potassium silicate and potassium-humic substance solution by polymerization process. The humic substance was obtained...

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Polyphenon Extraction Process From In vitro Culture of Camellia Sinensis L Callus With Ethyl Alcohol

Sutini Sutini, Widiwurjani Widiwurjani, Djoko Agus Purwanto, Wirdhatul Muslihatin

The purpose of this study was to obtain a polyphenon profile from callus extract obtained from in vitro culture of Camellia sinensis L. Polyphenon is one of the bioactive compounds found in Camellia sinensis L plants which can also be produced through in vitro culture. Polyphenon as a bioactive is often...

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Study of Humic Acid and Multiantagonis of Streptomyces Sp, Trichoderma Sp Application Techniques for Horticulture Plant on Marginal Soil

Penta Suryaminarsih, Wiwik Sri Harijani, Wanti Mindari, Widi Wurjani

Tomato, red pepper and melon are high-value horticultural crops. Crop production will be decrese couse of pathogenic microorganism and Pest .Some soil saprophytic microorganisms are natural enemies of soil-borne pathogenic microorganisms and pests. Streptomyces sp., Trichoderma sp. is a biological agent,decomposer,...

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Modeling and Optimization of Struvite Crystal Scaling Using Experimental Design Methodology For Maleic Acid

D. S. Perwitasari, A.P. Bayuseno, J. Jamari, S. Muryanto

This paper presents results of an investigation of scaling of magnesium ammonium phosphate hexahydrate (struvite) on a process batch crystallizer. In this study, variables, namely temperature (30-40oC), stirring speed (200-400 rpm), maleic acid concentration (1-20 ppm) were optimized using RSM (response...

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Effect of Acidic salts on Characteristics of Precipitated Silica from Geothermal Sludge

Srie Muljani, Ely Kurniati

This research was carried out to produce precipitated silica from sodium silicate using acidic salt as precipitator. The aim of this research is to study the effects of acidic acid on precipitated silica characterization. The sodium silicate solution was produced by extraction of geothermal sludge using...

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Application of Ion Exchange Method on Removal of The Ca2+, Mg2+, K+ and SO42- Salt Solution

Caecilia Pujiastuti, Ketut Sumada, Yustina Ngatilah

Salt product of Indonesian country is produced through the process of

evaporation and crystallization of seawater. The salt product contains sodium chloride (NaCl) levels ranging between 80-92% and the other are impurities such as magnesium chloride (MgCl2), calcium carbonate (CaCO3), potassium chloride...

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Characterization of Humat Compounds Spectroscopy Under Different Soil Management Systems on Mount Bromo West Slope

Purnomo Edi Sasongko, Wanti Mindari, Purwanto Purwanto, Widyatmani Sih Dewi, Ramdan Hidayat

Soil organic matter (OM) is very important in its function, but information about the chemical composition, chemical structure and the changes caused by anthropogenic factors in the processing system is still in the research. The research objective is to examine the characteristics of organic materials...

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Automatic Liquefied Petroleum Gas Leakage Control System Using Proportional Integral Derivative (PID) Proportional

Haryanto Haryanto, Achmad Fiqhi Ibadillah, Umar Faruq, Lilik Anifah

Along with the development of technology and information, human needs toward kerosene stove in household sector change over to Liquefied Petroleum Gas (LPG) stove, which is cheaper and more effective. However, the use of LPG stove should consider precised procedures as the gas is easy to explode. One...

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Adsorption of [AuCl4]- on Iron Sand Magnetic Material Coated with Aminobezimidazol Modified Silica

Abraham Laurens Rettob, Nuryono Nuryono, Yenni Pintauli Pasaribu, Yorinda Buyang, Richard Samuel Waremwa

Adsorption of [AuCl4]- using aminobenzimidazole modified silica coated on iron sand magnetic material (MMSA) was carried out. MMSA was synthesized via sol gel process. MMSA was characterized by Fourier Transform Infrared (FT-IR) spectrophotometer and X-ray diffractometer. The ability of MMSA to adsorb...

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The Effect of Citric Acid (C6H8O7) and Flow Rate to the Growth and Transformation of Crystal Phase of CaCO3

Christian Wely Wullur, Peter Sahupala

Scale formation, especially of calcium carbonate (CaCO3) is a serious problem faced by many industrial processes, such as chemical, desalination and oil industries. This paper discusses crystallization scaling of CaCO3 in pipes. The crystallizing solution was made by mixing equimolar solution of CaCl2...

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Phytochemical Screening of Ant Plant Myrmecodia rumphii Becc.

Yenni Pintauli Pasaribu, Yorinda Buyang, Abraham Laurens Rettob, Reinyelda Latuheru, Inggrid Marlissa

Ant plant Myrmecodia rumphii Becc. is an epiphytic plant that is widely used by local people as an herbal medicine to treat various diseases such as rheumatic and tumors. Methanol extract of M. rumphii Becc. showed high cytotoxicity against shrimp larvae Arthemia salina Leach and antioxidant potential...

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Formulation Syrup of Extract of Sarang Semut Plant (Myrmecodia rumphii Becc.) From Merauke

Yorinda Buyang, Yenni Pintauli Pasaribu, Ivylentine Datu Pallitin, Ni Luh Sri Suryaningsih, Taslim Ersam, Yatim Lailun Ni'mah

Sarang semut (Myrmecodia rhumpii Becc.) plants from Merauke Regency generally live on bus wood (Eucalyptus sp.). The results of previous studies found that sarang semut plants from Merauke have the potential as antioxidants in warding off free radicals of 92.6601%. The high antioxidant content encourages...

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Liquid Chromatograph – Mass Spectrophotometer and Anti Uric Acid Potential Studies of Ethyl Acetat Extract of Archidendron bubalinum (Jack) I.C. Nielsen Fruit Seed Shell

Erna Styani, Candra Irawan, Hanafi Hanafi, Lilis Sulistiawaty, Imalia Imalia

This study focused on identifying the types of compounds contained in the ethyl acetate extract of seed shell of Archidendron bubalinum (Jack) I.C. Nielsen (AbJICN) from Lampung Indonesia using Liquid Chromatograph Mass Spectrophotometer (LC-MS) and determining the potential of anti-uric acid in the...

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The Influence and The Analysis Of Alkyl Ketene Dimers (AKD) to Paper Resistance in Water Absorption and Chemical Solution Penetration

Henny Rochaeni, Candra Irawan, Mira Nurfitri, Poppy Sri Lestari, Unang Rosdianan

The sheet paper has been made with variations of addition of Alkyl Ketene Dimers (AKD) of 0, 10, 12, and 14 kg/T. The result was a paper with gramatures of ± 70 g/m2. The analysis of the paper sheet to its durability in absorbing water and penetrating the chemical solution of the mixture of NH4SCN2 2%...

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Effects of malonic acid on calcium carbonate crystalline

phases and morphology

Stefanus Muryanto, S. Sutanti, E. Supriyo, W.A. Putranto

Calcium carbonate (CaCO3) crystals are in much demand as low-priced fillers and brightening agents. For example, the pulp and paper industries use CaCO3 as fillers to enhance opacity, brightness, smoothness and printability. Such enhancement is regulated by the crystal properties: morphology, crystalline...

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Identification and Mitigation of Waste Construction Project Material (Case Study of Building Projects in Badung Regency)

I G A I Mas Pertiwi, W Sri Kristinayanti, K Wiwin Andayani, AA Putri Indrayanti

Construction projects contribute to the damage to nature, among others, from material extraction, material processing, material distribution, construction processes, land acquisition for buildings and energy consumption in building operations. Besides that, construction activities also produce high enough...

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Evaluation And Maintenance of Road Damage In Sidotopo Surabaya Road Using Pavement Condition Index (PCI) Method

Ibnu Sholichin, Nugroho Utomo

Road damage is caused by overloaded and repeated traffic loads, heat or air temperature, water and rain, as well as poor asphalt quality, so the road must

be maintained properly in order to serve traffic growth during the life of the plan. Routine and periodic road maintenance needs to be carried out...

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Mapping Porosity Values on Coast of Sampang District Using Satellite Image Data

Dian Purnamawati Solin, Hendrata Wibisana, Siti Zainab

Porosity soil is well known as soil properties and an indicator of the quality of soil. Applying porosity test in coastland area of Sampang District is highly needed, considering that the livelihoods of the people in Sampang are mostly farmers and also the development of village has recently grown rapidly....

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Labor Planning of Farmer Households

Endang Yektiningsih, Sigit Dwi Nugroho, Eko Nurhadi, Sugiarto Sugiarto

This research aims to identify the working time allocation of vegetable farm households and arrange a labor planning model specially at vegetable farming households. This research was held in Tutur Sub-District, Pasuruan Regency with a total sample of vegetable farming households as many as 60 persons....

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The Mathematical Model of Salinity Concentration In The Coastal Area of Sampang Distric Using Remote Sensing Data

Siti Zainab, Dian Purnamawati Solin, Hendrata Wibisana

Salinity is one of the parameters needed by farm workers and farmers to determine groundwater quality. High salinity values

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The Analysis of Retaining Wall Strengthening on Small Reservoir at Pilangbango Madiun as an Alternative of Existing Design

Wahyu Kartini, Sumaidi Sumaidi, Faishal Zhafiry

In 2016 the government of Madiun city carried out the construction of the reservoir in Pilangbango village, Kartoharjo sub-district, Madiun, East Java. The reservoir construction work has been carried out according to the schedule, however, several wall collapse and land subsidence have arisen. To date,...

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Flood Control Using Polders, Case Study: Watershed of Sadar River, Mojokerto, Indonesia

Minarni N. Trilita, Iwan Wahjudijanto, Lantanu Baggas Marsono, Novie

Handajani

Flooding is a problem experienced in area. In the Sadar river watershed are urban areas and mountainous areas. Sadar river has many tributaries. The flow characteristics have a large flow velocity. Sadar river passes through urban areas and empties into the Brantas river. Floods often occur in the Mojokerto...

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Application of Model View Controller Architecture in Hospital Inventory Logistic Management

Iwan Santosa, Firman Kurniawan, Eza Rahmanita, Aeri Rachmad

An inventory control system is a system to determine stock inventory at a certain time. This happens because there are several problems, namely the difficulty in finding out information on requests, receipts, usage, and stock of consumables. This happens because the data is not stored in a good file...

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Match Between Students' Anthropometry and Furniture Dimensions in the Library Reading Area at University of Trunojoyo Madura

Mahrus K. Umami, Halimatus Zahroh, Imron Kuswandi, Teguh Prasetyo, Mirza Pramudia

The compatibility between the dimensions of furniture and users' body is

crucial in keeping the users' performance. The objective of this study is to identify whether the furniture dimensions in the library reading area at University of Trunojoyo Madura (UTM) are appropriate/inappropriate to the students'...

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FATIGUE FLEXURAL BEHAVIOR RC BEAMS STRENGTHENED USING GFRP-SHEET AFTER SEAWATER IMMERSION

Arbain Tata, Anthonius Frederik Raffel, Muhammad Ihsan, Rudy Djamaluddin

Bridges or docks on coasts often fail due to fatigue loads. Sea waves striking bridge or the dock give a fatigue effect to the structure thus accelerating structural failure. This study aims to analyse glass fibre reinforced polymer (GFRP) reinforcement on reinforced concrete beams under fatigue and...

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Study Of Multi Layers Testing For Pavement

Sabaruddin, Muhammad Jamil

Multi layers in civil engineering has diverse meanings and uses for example on pavement has been used as a medium that provides theoretical information about the response of the pavement layer when receiving load in the middle, side and in the corner. In the other hand, multi-layers as a concept has...

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Application of Pavement Condition Index (PCI) on The Assessment of The Kalumata – Fitu Highway Section of Southern of Ternate City

Sabaruddin, Rabial Awaludin

In general, roads are built as infrastructure to facilitate mobility and accessibility of socio-economic activities in society. The existence of the highway is very necessary to support the rate growth of the economy, agriculture and other sectors. Considers to the benefits that are very important, therefore,...

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Folajikusesurabi Traditional House Study as An Environmentally Friendly Housing

Endah Harisun, M. Amrin MS. Conoras

The exploitation of natural resources and the environment these days, which only prioritizes economic growth, has given degradation of other elements of The expected benefit of this research is to introduce the traditional North Maluku architecture as one of the solutions in the construction of environmental...

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The Effects Of Volcanic Ash On The Strength And Permeability Mortar

Fitro Darwis, Ilham Banggu, Mufti Amir Sultan

Cement replacement materials have been widely used to reduce adverse environmental impacts, increase the strength and durability of concrete, such as fume silica, slag, fly ash or natural pozzolan (volcanic ash). Volcanic ash is material that released from the earth when volcanic eruptions occur. Volcanic...

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Flood Risk Assessment and Its Vulnerability in Coastal Villages, Central Halmahera District – North Maluku

Mohammad Ridwan Lessy, Nurhalis Wahiddin, Nani Nagu

Floods that occurred in Central Halmahera district had given a significant impact on environmental damage. This study aims to assess the risk level of flood and calculate vulnerability in study areas. The vulnerability will calculate based on social, economic and environmental aspects. Furthermore, the...

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Spatial and Environmental Condition of Bajo Tribe Settlement

in South Halmahera

Mustamin Rahim, Ardi Basri, Hendra Fauzi

This study aims to identify the spatial characteristics of Bajo Tribe settlement around coastal areas in South Halmahera, environmental analysis and settlement conditions by literature review and field observation. The results show that the existence of Bajo Tribe in North Maluku deployment in coastal...

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Roadworthiness Test For Traffic Safety

Nurwidyasari Usman, Muhammad Rizal, Edward Rizky Ahadian, Nani Nagu

Road growth must provide security and safety for road users. Article 23 of the Law of the Republic of Indonesia No.22 of 2009 states that the government as a road operator is obliged to provide a sense of security and safety for service users. The data analysis technique used in this project is qualitative...

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Proposed Empirical Calculation to Predict Bearing Capacity of Embankment on Reinforced Wooden Stems as Mattress Overlying Soft Soil

Suyuti Suyuti, Mufti Amir Sultan, Zulkarnain K. Misbah

Indonesia is an archipelago country that there are about thirty percent lowlands covered by deposit soft soils or peat soil. Local government has been built road infrastructure, but the soft soil layer has problem for soil stiffness.

Ministry of Public Works has published guideline for road construction...

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Solid Waste Management: Mapping of Temporary Waste Sites and Potential Wild Solid Waste in Ternate City

Nani Nagu, Edward Rizky Ahadian

Garbage is a classical problem faced by all cities in Indonesia. The same problem also found in Ternate due to various aspects including population growth and rapid urbanization, inadequate number of facilities, lack of landfill management systems based on environmentally, and the implementation of reduce,...

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Stability Analysis of Underwater Pipeline Inter Island for Drinking Water

Wati Asriningsih Pranoto, Tri Suyono

Indonesia is an archipelago with more than 17 thousand islands, both large and small islands. Some inhabited small islands do not have the potential of fresh water as a source of drinking water, so it needs special treatment in drinking water supply. Provision of drinking water with high technology such...

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Towards Eco Green Construction With Pumice Fine Aggregate Concrete

Abdul Gaus, Imran Imran

Concrete production in construction work is one of the causes of damage to the environment. the use of local materials as aggregates in concrete mixes is expected to be more eco green in construction. With the uniqueness of the pumice it is tried to serve as a fine aggregate for concrete mixing with...

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Analysis of the Effects of Traffic Volume on the Pavement Condition in the Educational Zone of Merauke Regency

Dewi Sriastuti Nababan, Herbin Florensius Betaubun, Theresia Widi Asih Cahyanti, Budi Doloksaribu, Jeni Paresa

Among types of land use vital for the development of Merauke Regency is the land use intended to provide its population with education. Land use for educational purposes (the educational zone) in Merauke Regency, such as the one in Pendidikan Road, Kamizaun Road, and Ternate Road, constitutes important...

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The Selection of Rain Distribution Analysis Method in (Bengawan Solo Watershed)Downstream Sub-Watershed

Dina Limbong Pamuttu, Umboro Lasminto, Daud Andang Pasalli, Yuli Helena Margaritha Rada, Abner Doloksaribu

Hydrological factor causes flood. Thus, it needs to be examined through rain frequency analysis by using continuous chance distribution. The location of this research is at the downstream sub-watershed of Bengawan Solo River. Average rainfall inflow area is calculated by Polygon Thiessen method with...

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The Feasibility of the Kancingan House Structure in Merauke City

Sari Octavia, Henry Soleman Raubaba, Yashinta Irma Pratami Hematang, Anton Topan

Kancingan house is a house made of wood materials as its main structure but the walls are still made of bricks. The use of wood as the concrete-replacing materials is due to the relatively lower cost than the permanent structure made of concrete as the main structure since the concrete materials composed...

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Study on Compressive Strength of Sarmayam Clay Stabilized with Cement and Polypropylene Fiber

Suyadi Suyadi, Hairulla Hairulla, Philipus Betaubun, Agustan Agustan, Dina Pasalolo

Land is the place where a structure or construction is established, both construction of buildings and roads. What often causes problems is if the soil has bad properties such as high plasticity and a large potential for shrinkage. One way to improve the shrinkage properties is to stabilize the soil...

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Mapping of Historical Building in Merauke uses a Geographic Information System (GIS) as a Form of Collaboration of Engineering Science

Yashinta Irma Pratami Hematang, Izak Habel Wayangkau

Despite being located on the border area, Merauke has a very important architectural historical heritage. However, if its current existence is not well-preserved, it will lead to extinction. In fact, the historic building provides an

image or identity and increases the tourism value of a city. The Old...

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Correlation of Embankment Density Degree with Slopes Landslides Safety Factor

Suryanegara Dwipa, I Gede Sastra Wibawa, I Nyoman Ramia, I Wayan Wiraga, I Wayan Arya

The purpose of this study was to find the relationship between density D and safety factor SF of the embankment against landslides. If the relation between D and SF is known, then we could simplify the slope stability calculation. The safety factor against landslides could be determined by only entering...

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The Effect of Performance-Based Practical Assessment Model Towards Students' Competency Level at Civil Engineering Workshop in Kupang State Polytechnic

Wayan Sri Kristinayanti, Wira Ditta Lokantara, I Made Anom Santiana, N K Suciani

A formal education pathway should include a comprehensive assessment that oversees students' competence not only in terms of cognitive aspect, but also the students' psychomotor. Performance-based assessment was developed in this paper and aimed to improve student's all-round performance in their studies...

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Analysis of the Selection of Alternative Work Methods for Structural Work Using the Zero-One Method at the Guest Room Building Development Project in Sanur, Bali

Ni Ketut Evi Kusumadewi, I Wayan Sudiasa, Made Sudiarsa

There were various alternative construction work methods that could be chosen as the most suitable in order to achieve the project's final goal by using the resources efficiently with an optimum result (cost, quality, and time). The alternative work methods could be applied on various projects, such...

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Ergonomics for Sustainable Groundwater Conservation Program

Lilik Sudiajeng, I Wayan Wiraga, Made Mudhina, I Gede Nyoman Suta Waisnawa

This article aims to describe the importance of ergonomics implementation for the sustainability of groundwater conservation programs. Ergonomics concept has been applied in research on groundwater conservation in Denpasar City, Bali, Indonesia (2013-2018), started from problem identification, data collection...

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Earthquake Prediction System using Neuro-Fuzzy and Extreme Learning Machine

Basuki Rahmat, Fitri Afiadi, Endra Joelianto

Knowledge of earthquake predictions is very important, especially to recognize patterns of occurrence. This paper proposes an earthquake prediction system, in the form of b-value predictions as parameters that indicate the potential for earthquakes. The methods used are neuro-fuzzy with ANFIS structure...

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Replies Identification in Question Answering System using Vector Space Model

Intan Yuniar Purbasari, Fetty Tri Anggraeny, Masti Fatchiyah Maharani

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Scientific Thinking Skills: Why Junior High School Science Teachers Cannot Use Discovery and Inquiry Models In Classroom

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***Abstract*—This study aims to describe the difficulty of the teacher in distinguishing the implementation of discovery and inquiry learning models in science learning and the factors that led to the scientific thinking skills of junior high school science teachers. The case study design used in this study involved 16 science junior high school teachers in East Lombok who have difficulties in distinguishing discovery and inquiry learning models as research samples. The results showed the teachers had scientific thinking difficulties, ranging from observing to identify problems/questions, formulating hypotheses, thinking deductively, and inductive thinking, distinguishing data characteristics and processing, and drawing conclusions. Therefore, teachers should learn scientific thinking skills in order to facilitate learning and trigger students' scientific thinking skills.**

Keywords*—*Scientific thinking skills; Discovery model; Inquiry model; Science teacher

I. INTRODUCTION

The application of the 2013 curriculum in Indonesia requires the ability of teachers in scientific thinking. All subjects, especially science, use active learning models that demand maximum student involvement in learning. The active learning model that is highly recommended for use in science learning is the discovery and inquiry models. Through these models, students are engaged to explore and construct their knowledge independently even in the guidance of teachers through prepared learning facilities. The teachers are not just present science matterial but must have the ability to facilitate students learning to construct their own knowledge.

Unfortunately, in our field experiences, many science teachers were found unable to implement inquiry and discovery in their classroom. They also cannot distinguish discovery and inquiry models in their learning plans and in science classrooms. Consequently, the teachers cannot facilitate students to construct their knowledge incependetly. [11] pointed out the scientific thinking skills of the teachers caused the difficulty in implementing discovery and inquiry models. Scientific thinking skills are often referred to as process skills, basically are the ability to apply scientific methods, starting from identifying and formulating problem or question, formulating hypotheses, designing experiment to collecting data, analyzing data, to drawing conclusions [11].

Scientific thinking skills are basically a combination of deductive thinking and inductive thinking. Scientific thinking skills are needed in learning that uses models or approaches that use scientific processes, such as: inquiry learning models and discovery models. Deductive thinking is in principle a scientific process that starts from facts or concepts or principles or theories that are generally applicable to study and construct knowledge, such as: facts, concepts, theories that are specific. Instead, think inductively, examine and process specific information to produce general information or knowledge. Both of these thinking skills are needed in learning that involves religious processes [5].

According to [4] discovery model learning is very promising because it involves students actively constructing

their knowledge through experimental activities. In order for discovery learning to succeed, students must have discovery skills, including: formulating hypotheses, designing experiments, predicting, and analyzing data and regulative skills, such as planning and monitoring [7]. Discovery learning stages include: stimulating students through observation of facts and events, formulating problems/questions, collecting data, analyzing data, verifying data, and making generalizations (conclusions). With these stages, both teachers and students are required to be able to think scientifically that will help the learning process succeed in achieving its goals.

Inquiry learning in principle aims to investigate because of curiosity through a scientific process. In Indonesia, this inquiry model is often referred to as a scientific approach, that is observing, asking, collecting data, associating, concluding, and communicating. Inquiry is considered as an attempt to find truth, information, and knowledge [10]. Inquiry is also often synonymous with the terms investigation, research, questioning, or finding out. In learning, inquiry is a learning strategy or process skill [1]. Inquiry is considered successful if it already knows something previously unknown [2].

The inquiry learning model steps are almost the same as discovery models, but the results are not always in the form of generalizations. [8] describes the main steps of inquiry, namely: 1) identifying questions and concepts that guide investigation, 2) designing and investigating, 3) using tools and mathematics to develop investigation and communication, 4) formulating and revising scientific explanations and the model uses theory and facts, analyzes explanations and alternative models, and 5) communicates and produces scientific arguments.

Efforts to trigger students constructing knowledge are through discovery and inquiry models, teachers more frequently presents information or knowledge through the phenomenon of students' daily lives [9]. However, constructing knowledge through contexts is not easy because it requires the ability to think scientifically and learn transformation, both teachers and students [6].

The problem that is used as the focus in this study is how scientific thinking skills of science teachers who have difficulty understanding and implementing discovery and inquiry learning models. In addition, this study also examines the factors that cause science teachers to have difficulty distinguishing discovery and inquiry learning models in science learning.

II. METHOD

To answer the research focus question, we used a case study design to describe the scientific thinking skills of science teachers in relation to the difficulty of understanding and distinguishing discovery and inquiry learning models. Participants in this study were junior high school science teachers in East Lombok district who claimed they could not distinguish how to operate discovery learning models and inquiry learning models in science learning. Participants were taken randomly as many as 16 people.

The instrument used is a simple scientific thinking ability test of 10 multiple-choice items that are specifically designed to diagnose aspects of inductive thinking and deductive thinking that are widely used in discovery learning models and inquiry learning models. In addition, this study also uses an understanding test of the discovery and the inquiry models.

Data collection was carried out in two stages, namely providing a test of understanding the operation of discovery learning models and inquiry learning models and scientific thinking ability tests. Data analysis was carried out through content analysis of participants' answers to trace the causes of participants unable to distinguish the operation of discovery learning models and inquiry models. The factors that cause teacher difficulties are then described through percentage analysis.

III. RESULTS AND DISCUSSION

The results of the study consist of two parts, namely the description of the results of the participants' understanding of discovery learning models and inquiry learning models and descriptions of the causes of difficulty of science teachers to distinguish discovery learning models and inquiry models in science learning.

TABLE I. LAYOUT OF THE DIFFICULTY OF THE TEACHER UNDERSTANDING AND DISTINGUISHING THE DISCOVERY MODEL AND THE MODEL OF INQUIRY IN SCIENCE LEARNING

Scientific thinking	**Teachers' difficulty in distiguishing discovery and inquiry models in science classroom**	**Percentage of teachers (%)**
Problem/ question	1. Problems types refer to discovery or inquiry models 2. Problem/question identification 3. Problem/question statement	100
Hypothesize	1. Hypothesize forumula refer to discovery or inquiry models 2. Hypothesize generation 3. Hypthesize statement	100
Data	1. Data for discovery or inquiry 2. Data analysis 3. Data display	100
Conclusion	Generalization or cases	100

Based on the data in Table I, the science teacher considers that the formulation of the problem, hypothesis, data characteristics and conclusions in the learning model of discovery and model inquiry are the same. This shows that the science teacher cannot distinguish the characteristics of the operations of discovery learning models and inquiry learning models.

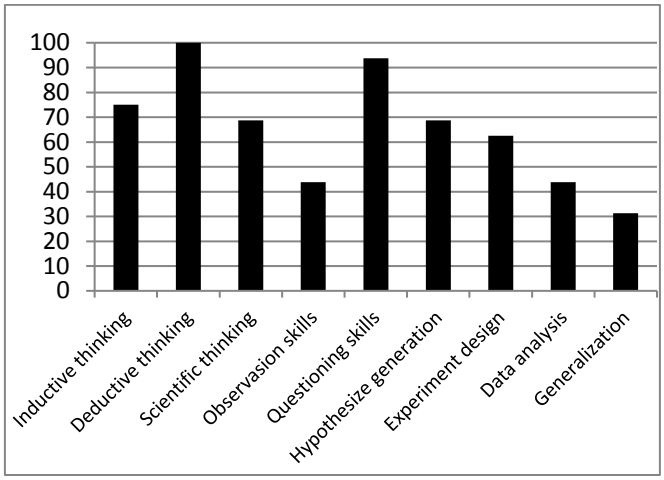

Fig. 1. The science teachers' difficulty in operating scientific their thinking skills

Figure 1 shows that teachers most difficult to operate deductive thinking. Teachers are also have difficulty in questioning skills that trigger deductive thinking. The detailed thinking skills difficulties of the science teachers are shown in Table II.

TABLE II. SCIENTIFIC THINKING SKILLS OF SCIENCE TEACHERS

Scientific thinking skills	**Teachers' difficulty to use their scientific thinking**	**Teacher Percentage (%)**
Induktive and deductive thinkings	Statements are generated from: Induktive thinking Deduktive thinking Scientific thinking	 75 100 68.75
Observation skills	Observe facts / phenomena that trigger inductive thinking Observe facts / phenomena that trigger deductive thinking	0 43.75
Questioning skills	Problem/Question formulation Question that trigger inductive thinking Question that trigger deductive thinking	43.75 56.25 93.75
Hypothesize generation	Determine the hypothesis formulation that is appropriate for a problem/question	68.75
Experiment designing	• Variabel identification • Distinguish questions that require activities 1. Experiment 2. Observation	6.25 62,50 25
Data analysis	Interpret data that display as: Data in table News of facts	 31,25 43,75
Generalization	Conclusion	31,25

Based on Table II, it appears that science teachers have difficulty distinguishing inductive thinking processes, deductive thinking processes, and scientific thinking processes. These difficulties also appear in identifying statements and or questions that trigger the use of inductive thinking processes and deductive thinking processes, although more than 50% of teachers can follow the scientific thinking process. More than 50% of teachers also have difficulties in formulating hypotheses that are appropriate to the problem or question.

TABLE III. SOME EXAMPLES OF THE APPLICATION OF SCIENTIFIC THINKING SKILLS IN SCIENCE LEARNING OF DISCOVERY AND INQUIRY MODELS

Inductive thinking in discovery learning model	**Inductive thinking in inquiry learning model**
Are all meatballs in the city of East Lombok containing dangerous artificial additives?	Does Pak B's meatballs contain dangerous artificial additives?
1. All meatballs in the city of East Lombok do not contain harmful artificial additives 2. Not all meatballs in the city of East Lombok contain dangerous additive	Pak B's meatballs contains harmful artificial additives
Meatballs type ***Food Additive*** A Positive B Positive C Positive D Negative	***Foods*** ***Food Additives*** Meat-balls Positive Tofu Positive Noodles Positive Salty fish Positive
1. All meatballs in the city of East Lombok do not contain harmful artificial additives 2. Not all meatballs in the city of East Lombok contain dangerous additives	Meatballs, tofu, noodles and salted fish in Lombok Pak B contain dangerous artificial additives

Based on the data shown in Table I and Table II, it appears that science teachers have difficulty operating their scientific thinking skills. These difficulties include distinguishing the characteristics of scientific questions, both those that trigger inductive thinking skills and deductive thinking skills. Of the three categories of thinking abilities examined in this study, teachers generally have difficulties in operating deductive thinking skills, inductive thinking skills, and scientific thinking abilities. As a result, science teachers cannot distinguish characteristics of problems or questions that trigger the use of these thought processes. Mistakes in operating this scientific thinking ability were also reviewed by [11] who discovered 10 teachers' mistakes in operating their scientific thinking abilities.

The success of science learning using discovery and inquiry models is very much determined by the scientific thinking skills of teachers and students [5]. Even according to [7], the two learning models also require the ability to manage and manage, especially in terms of planning and monitoring. In the case of science teachers who have difficulty distinguishing between learning and inquiry models, it is an indication that science teachers are still having difficulty operating their scientific thinking skills. The impact is the teacher's inability to facilitate student learning through scientific processes or investigation.

The failure of teachers in facilitating student learning through discovery and inquiry learning can produce

students' thinking habits that deviate from scientific thinking processes or habits of mind [3]. If this happens students will have difficulty constructing the knowledge expected by the 2013 curriculum, and can even lead to student confusion. Students experience difficulties or fail to observe the facts or phenomena provided or oriented by the teacher. The teacher cannot orient and even identify the facts or phenomena of the science that students should be observing, causing disruption of the inquiry process that triggers students to ask questions. In this case, the teacher often finds students not asking because information or phenomena facilitated by the teacher does not trigger students to ask.

Difficulties in asking will cause the next process to be difficult to continue because scientific thinking skills and student inquiry skills are not stimulated properly. As a result, the teacher asks questions and guides students to follow the scientific thinking process that the teacher wants, as in the learning of structured type inquiry models. The scientific process designed by the teacher is still questionable when the teacher also has difficulty operating his scientific thinking skills.

Teachers who have difficulty operating their scientific thinking skills will be wrong in orienting students both in observing and identifying questions. As many as% of teachers orient students to identify the question: "Why can methanil yellow cause irritation to the digestive tract?" In part, "Where did the seller know to get the dangerous substance?" Some teachers want students to ask: "how to distinguish tofu that contains methanil yellow dye and know that does not contain yellow methanil?" These three types of questions trigger different scientific investigative processes in students which ultimately produce different knowledge. In the first instance, students will construct methanil yellow properties that cause irritation of the digestive tract that students can access via the internet. In the second question, students will be able to find out if they ask the tofu seller or the person who knows the know-how gets the information that contains the methanil yellow. In the third question, students will conduct an investigation in the form of identifying how to distinguish tofu containing yellow methanil and not. The third question is very relevant to the problems faced by the community and can be investigated by students, while the first and second questions can be known by students through information tracing directly through the literature or asking the seller who is less relevant to the problems presented in the facts

IV. CONCLUSION

Conclusions that can be drawn from this study, namely the teacher has difficulty operating the ability to think scientifically, especially the ability to think deductively. As a result, teachers cannot facilitate student learning optimally, ranging from presenting facts or phenomena that trigger students to ask questions, investigate, process data, and produce conclusions. Students become knowledge difficulties that are expected to be achieved by the curriculum. The main causes of teacher difficulties in discovery and inquiry model learning are the difficulty of teachers in operating inductive thinking skills and deductive thinking, starting from identifying problems or questions, formulating hypotheses, designing and conducting experimental activities, processing data, and drawing conclusions.

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