“Encountering Global Challenges through Innovation on Science, Technology, Engineering, and Mathematics (STEM), and Education”

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PROCEEDINGS

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(IConMNS) 2017

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Denpasar, September 6th – 7th, 2017
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I Made Pasek Anton Santiasa, S.Pd., M.Sc.
Prof. Dr. I Wayan Suastra, M.Pd.
PREFACE

Om Swastyastu, Assalamualaikum Wr. Wb., Namo Buddhaya, Shalom

First of all, let us praise and thank The God Almighty for His graces bestowed on us. Allow me to heartily welcome all participants to Bali. It is my pleasure and privilege to extend our warmest welcome to all participants of the International Conference on Mathematics and Natural Sciences (IConMNS). The theme of the conference is “Encountering Global Challenges through Innovation on Science, Technology, Engineering, Mathematics (STEM) and Education”. The objective of the conference is to promote the exchange of ideas and presentation of the advancements of research in the area of mathematics, natural sciences, technology, engineering, and education.

The conference is expected to become a forum for researchers and academicians to discuss research and to establish collaboration between them. I hope that you enjoy the scientific atmosphere of the conference and that you can talk to each other and make friends to establish future collaborations.

The Faculty of Mathematics and Natural Sciences, Universitas Pendidikan Ganesha is proud to host this conference. The conference received 128 abstract submissions, of which 109 manuscripts are presented orally. Moreover, the conference is attended by 106 non-presenter participants. To all presenters and participants, thank for your enthusiastic responses to the conference. Your present in this conference is highly appreciated.

During the conference, there are four plenary talks and eight invited presentations by various experts. We are honoured to have distinguished keynote speakers: Prof. David James Young from University of the Sunshine Coast, Australia; Prof. Edward R T Tiekink from Sunway University, Malaysia; Dr. Wim T van Horssen from Delft University of Technology, the Netherlands; and Dr. Natthida Rakkapao from Prince of Songkla University, Thailand. The committee thanks all of you for having kindly and cordially accepted the invitation. The committee also thanks and appreciates all invited speakers from LPTK.

The committee appreciates with gratitude all parties for their support in various forms during the preparation for and the running of the conference. On behalf of the committee and the Faculty, I acknowledge the Rector of Universitas Pendidikan Ganesha for his endless commitment and financial support. To the Rector, who will officially open the conference, I would like to extend our gratitude and appreciation.

The committee has worked hard to organize this conference. This conference would not be possible without dedicated and coordinated efforts of the committee members. I thank all of you for making this a reality.

I wish you a fruitful conference and an exciting stay in Bali.

Om, Shanti, Shanti, Shanti, Om; Wassalamualaikum Wr. Wb.; Sadhu, Sadhu, Sadhu; Shalom

Denpasar, 6 September 2017
Chair,

Sariyasa
OPENING ADDRESS: RECTOR OF UNIVERSITAS PENDIDIKAN GANESHA

Honorable : Dean of Faculty of Mathematics and Natural Sciences
All Vice Rectors of UniversitasPendidikanGanesha
Keynote speakers, distinguished guests or participants of today’s conference, ladies and gentlemen

Om Swastiastu
Assalamu’alaikumwarahmatullahiwarakatuh
Good morning
May peace and God’s blessing be upon us all

First of all, let us express our great gratitude to God the Almighty, because His Blessing has made us
be in good condition or health, so that we all can be here today to attend International Conference on
Mathematics and Natural Sciences (IConMNS). This conference is organized by the Faculty of
Mathematics and Natural Sciences, UniversitasPendidikanGanesha, as an attempt to share information
derived from the results of studies on sciences and technology conducted by researchers from various
countries.

Distinguished Guests, Ladies and Gentlemen
It is realized that we nowadays exist in a period of time characterized by the development of sciences,
especially the development of natural sciences, and technology, which happen exponentially. It should
also be admitted that there is a close interrelation between sciences and technology. This can be seen
from the fact that basic sciences are hadly required for the optimal development of technology. On the
other hand, an effort of developing basic sciences greatly requires continuous support from
technology. With regard to this point, wise people are always in agreement that “Science without
technology is fruitless and technology without science is rootless”.

An important thing that needs to be kept in mind is that in developing science and technology, mathematics plays very important role. Mathematics is considered as a tool and a communication
language of science and technology. This quantitative nature of mathematics increases the predictive
power and control of science. This can also be put in a different way that science provides much more
exact responses, which enable to have more accurate and smarter problem solving. There is a
possibility that mathematics enable science to undergo development from qualitative level of science
to quantitative level.

For the sake of being able to follow the rapid development of science and technology, having adequate
mastery of mathematics, science and technology becomes the need of every individual. It should also
be noted that having a good knowledge in mathematics, science, and technology is getting more and
more important in work places. This is due to the fact that there are quite a large number of job
opportunities pre-requesting learning capacity, logical thinking, critical thinking, decision making,
cooperation, and problem solving. Considering this phenomenon, all of the countries over the world,
without exception Indonesia, pay tremendous attention to the development of mathematics, science,
and technology, which can be conducted through researches and education in various levels.

Distinguished scientists, ladies and gentlemen,
Realizing the significances of the roles of mathematics, science, and technology, I as the rector of
Ganesha University of Education would strongly support and highly appreciate the carrying out of
International Conference on Mathematics and Natural Sciences (ICoMNS), presenting the theme:
“Encountering Global Challenge through Innovation on Science, Technology, Engineering, and Mathematics (STEM), and Education”.

Through this conference, it is greatly expected that academicians and researchers from different parts of the universe can mutually exchange experience, and expertise in the field of mathematics, sciences, technology, engineering and education. It is also hoped that there arises innovative ideas, the establishment of research cooperation, and human resources sharing in terms of mathematics, sciences, technology, engineering, and education, both in national as well as international levels.

Honorable guest, ladies and gentlemen
It is obviously realized that today’s conference would not be meaningful without the readiness and the presence of the key-note speaker coming from variety of countries and from distinctive discipline. My high appreciation is, there for, particularly directed to the key-note speakers for your tiring long journey to make this event successful. My great thanks and appreciation is also due to all presenters for the parallel sessions, who come from various countries, universities, and different scientific disciplines in mathematics, science, technology, engineering, and education, to present the result of your studies as well as your ideas which will enrich the outcome of today’s conference. Thank you very much for your participation.

It is also expected that innovative ideas as to the result of the researches and mathematics, scientific, and technological education which will be presented in this international conference, will be able to give positive contribution to the improvement of the mastery of science and technology, and the improvement of the quality of mathematics, science, and technology education in various educational levels.

This international conference will not come into existence without the initiation of the Faculty of Mathematics and Natural Sciences, and without the hard work of the member of today’s event committee. Consequently my thankfulness and appreciation are also devoted to the related faculty and the members of the committee. Thank you for your struggle and hard working to make this conference come true.

Ladies and Gentlemen.
That’s all I could say in this special and exciting opportunity. I apologize if there is any inconvenient expression in my opening speech. I end my speech by saying
Om Santhi Santhi Santhi Om
Assalamualaikum Waramatulahiwabaraka tuh
May God bless us all.

Denpasar, September 6th, 2017

Rector of Universitas Pendidikan Ganesha
I NYOMAN JAMPEL

As requested by the conference committee, I would like to declare that the International Conference on Mathematics and Natural Sciences, today Wednesday, 6 September 2017, is officially opened.
LIST OF PARTICIPANTS

The tolerance improvement of local soybean in waterlogging condition through the combination of irradiation and in vivo selection

TB Saputro, KT Purwani, VS Fatimah, EM Stevia and N Jadid

Identification of Microscopic Fungus in Gill of Skipjact Tuna (Katsuwonus pelamis L.) at Traditional Markets in Singaraja – Bali

I A P Suryanti, N L P M Widiyanti, S Tangguda, dan I A K Tridewi

Genotyping SNP Rs12255372 TCF7L2 Gene Using Three-Primer ARMS-PCR for Detection T2DM in Indonesian Batak Ethnic

Syamsurizal and H Kadri

Expression pattern of drought-responsive genes in burley tobacco under in vitro water deficit

N Jadid, E Estiasih, T B Saputro, K I Purwani, D Hidayati, E V Permatasari, W D Kurniawan

Characteristic of synthetic seeds from two medicinal plants (Moringa oleifera and Camellia sinensis)

W Muslihatin, N Jadid, T B Saputro, K I Purwani, C E S Himayani and A W Calandry

The effect of addition sucrose concentrations toward weight of Nata DE Lontar (Borassus flabellifer) Linn

N L P M Widiyanti, S Mulyadiharja, I N Sukarta, N W I Pradnyandari

Potential of yellowfin tuna catch in East Java-Indian Ocean based on length frequency and age distribution

D Hidayati, R Herlambang, N Jadid, N Nailis Sa'adah, N Maulidina and A P D Nurhayati

Cytotoxic activity of andrographolide in colon cancer through inhibition cox-2 by in silico study

N P L Laksmiani, K R Reynaldi, M I Widiastari, I P W Nugraha, I M K Suyadnya and R A I K Maharani

The inhibitory activity of peonidin purple sweet potato in human epidermal receptor-2 receptor (her-2) expression by in silico study

N P L Laksmiani, M I Widiastari and K R Reynaldi

The formation of mini illustrated dictionary of rare plants in the village forest of Penglipuran, Bangli, Bali

N Wijana and I G A N Setiawan
Identification of coral recruitment in Lembongan Island, Nusa Penida, Bali
  I N D Prasetia, Supriharyono, S Anggoro and L Sya’rani

The structure of the *Meiozoobenthos* community and its contribution to demersal fishery in mangrove forest ecosystem in Banyuwedang Bay, Buleleng, Bali
  I B J Swasta

Silicon chemistry for sustainable development of rice agriculture
  I W Karyasa

Bioprospecting of the Balinese marine sponges and nudibranchs
  I W Mudianta

Synthesis and characterization of hydrogel composite based on bacterial cellulose-gambir leaf extract (*Uncaria gambir* Roxb.)
  A Putra, B A Nugraha and A Amran

Characterization and analysis of the molecular weight of corn corbs microcrystalline cellulose (MCC) fiber using mass-spectrometry methods
  W R Kunusa, H Iyabu , M Taufik and D N Botutihe

Numerical solution of SIR model for transmission of tuberculosis by Runge-Kutta method
  S Side, A M Utami, Sukarna and M I Pratama

On super \((a, d)\)-edge-antimagic total labeling of Möbius ladder
  P K Dewi, I N Suparta and K Y Sumalasia

Graceful labeling for open superstar of complete bipartite graphs \(S^2(t,K_{mn})\)
  I N Budayana, I N Suparta and N P H Purnamayanti

Classification of breast cancer using Wrapper and Naïve Bayes algorithms
  I M D Maysanjaya, I M A Pradnyana and I M Putrama

\(\alpha\)-Sutte Indicator: A new method for time series forecasting
  A S Ahmar, A Rahman and U Mulbar

Development of Low Sidelobe Level Array Antenna for Synthetic Aperture Radar Sensor
  Yohandri, Yulkifli and J T S Sumantyo
Characterization the geometry of the peat soil of Pontianak using fractal method
   J Sampurno, A Muid, Zulfian and F D E Latief

Dielectric properties and bioactivity of PVA/PEG/TiO$_2$ fibers for capacitive based body sensor
   M Diantoro, T Istirohah, A Fuad and I Ristanti

New simple synthesis, crystal system and physical properties of Zn$_5$S$_2$ compound
   A D Kusumawati, T Suprayogi, M Diantoro, I Dasna and Subakti

Development of digital viscometer based on sensor technology and microcontroller
   Yulkifli, Yohandri and R Kurniati

Influence of high energy milling time on nano-quartz structure from West Sumatera
   Ratnawulan, A Fauzi and Y Zahara

Testing on porosity of composite material composed by ultrafine amorphous silica (UFAS) from rice husk using X-ray micro-computed tomography
   P Widiarini and G B Suparta

Correlation of seismotectonic parameter and seismic quiescence z-value in West Sumatra Indonesia
   Syafriani, Yulkifli, A Z Sabarani and F D Raharjo

Effect of sintering temperature on crystal structure and grain size of Manganese Ores from West Sumatera
   A Fauzi, Ratnawulan and P J Putri

Didactical design of integers: an elementary school teachers creation viewed from didactical situation perspective
   S Prabawanto, D Suryadi, E Mulyana, D Ratnasari and F Dewi

Effectiveness of problem-based learning to optimize student learning outcomes in regression analysis course
   M Susilawati and D P E Nilakusumawati

Scaffolding in problem based learning to increase students’ achievements in linear algebra
   I N Gita and R A Apsari

Using puzzle to encourage students to do problem posing
I M Candiasa, N Santiyadnya and G K A Sunu

Assessing by doing: A Balinese culture based assessment

N M S Mertasari, I M Yudana and N Gita

Design research on plane figure learning by using picture story and pairing game to improve mathematical communication skills of second grade of primary school students

Lisnani

The development of mathematical learning material based on model-eliciting activities (MEAs) approach to improve mathematical problem-solving skill of students of grade X of Senior High School Padang

Irwan, A Asmar and H Syarifuddin

The effectiveness of mathematics software aided learning tool with performance assessment on student independence and student learning outcomes

G A Mahayuki

Developing blended learning environment to improve learning performance and self-reliance for junior high school students

I M G Sukawijaya and I G P Sudiarta

Investigation on students’ mathematical online discussion: A case study in grade 8 SMPN 1 Denpasar

I G P Sudiarta, I N Sukajaya and I G P Suharta

PISA-like problems using Indonesian contexts

B Murtiyasa, S Rejeki and R Setyaningsih

Integrating ethnomathematics into open-ended problem based teaching materials

I P P Suryawan and Sariyasa

On the implementation of e-learning with mathlet GeoGebra in Analytic Geometry course to improve students’ engagement and achievement

G Suweken

The effect of problem based learning model and authentic assessment on mathematical problem solving ability by using numeric ability as the covariable

I K Darma, I M Candiasa, I W Sadia and N Dantes

Exploration of table and graph literacy of statistics student at Universitas Negeri Makassar
M A Tiro, M K A and A S Ahmar

Character building in physics learning for Indonesia children
I M Astra

The identification of the 11th grade students’ prior knowledge of electricity concepts
K Suma, I W Sadia and N M Pujani

Types of junior high school students errors in science problem solving
I M Mariawan and N N Parwati

The Effectiveness of problem-based hybrid learning model in physics teaching to enhance critical thinking of the students of SMAN
R Sujanem, S Poedjiastriuti and B Jatmiko

The contribution of school climate, achievement motivation, and self-concept to science learning achievement
Surayanah1 and L Karma

The development of smoky glass box as a physics instructional medium on light subject
S Hartini, M Syahrirani, and A Salam

Identification of chemistry teaching problems of a prospective teacher: A case study on chemistry teaching
I W Redhana, I B N Sudria, I N Suardana, I W Suja and N K N Handayani