

ISSN: 1742-6596

Journal of Physics

Conference Series

**Ahmad Dahlan International Conference on
Mathematics and Mathematics Education 8-9
November 2019, Yogyakarta, Indonesia**

1613

Volume 1613

Accepted papers received: 03 August 2020

Published online: 21 September 2020

Editor:
Martin L

The open access *Journal of conference proceedings*
iopscience.iop.org/jpcs

PAPER • OPEN ACCESS

The Preface of the Second Ahmad Dahlan International Conference on Mathematics and Mathematics Education (ADINTERCOMME) 2019

To cite this article: P W Prasetyo *et al* 2020 *J. Phys.: Conf. Ser.* **1613** 011001

View the [article online](#) for updates and enhancements.



The Electrochemical Society
Advancing solid state & electrochemical science & technology

240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021



Abstract submission due: April 9

SUBMIT NOW

The Preface of the Second Ahmad Dahlan International Conference on Mathematics and Mathematics Education (ADINTERCOMME) 2019

P W Prasetyo, J Purwadi, U Khasanah, S Fahmi, R C I Prahmana, A Istiandaru, F Setyawan, A Hendroanto, D Astuti, S W Priwanto, V Istihapsari, D A Yuwaningsih, N Irsalinda, B A Nurnugroho, Z A Rafsanjani-Hsm, Y Ariadi

Editorial Team of ADINTERCOMME's 2019 Publication, Universitas Ahmad Dahlan Kampus IV UAD, Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Daerah Istimewa Yogyakarta 55191

E-mail: puguh.prasetyo@pmat.uad.ac.id

Preface

The Ahmad Dahlan International Conference on Mathematics and Mathematics Education, abbreviated as AD INTERCOMME, is a biennial international conference hosted in a cooperation by the Mathematics Department - Faculty of Science and Applied Technology - and the Mathematics Education Department - Faculty of Teacher Training and Education - of Universitas Ahmad Dahlan, Yogyakarta, Indonesia. It aims to provide a great forum for worldwide mathematicians, professors, teachers, and researchers to share their ideas about the trends and the emerging issues both in mathematics and mathematics education. In 2019, the AD INTERCOMME would be implemented for its second edition. We invite researchers and practitioners to come and to contribute in this conference. We would be very happy to welcome you in Yogyakarta.

The keynote presentations are provided especially to show the contribution of Mathematician and Mathematics Educators in the world of mathematics and mathematics education towards research and knowledge sharing where our conference theme for this year is the contribution of Mathematics and Mathematics Education in Industrial Revolution Era 4.0. The main event is the talk of three keynote speakers. The first keynote speaker is Associate Professor Dr. Mazlini Adnan from Universiti Pendidikan Sultan Idris, Malaysia. The second keynote speaker is Associate Professor Martianus Frederick Ezerman, Ph.D from Nanyang Technological University, Singapore. The third keynote speaker is Associate Professor Dr. Sitti Maesuri Patahuddin from University of Canberra, Australia.

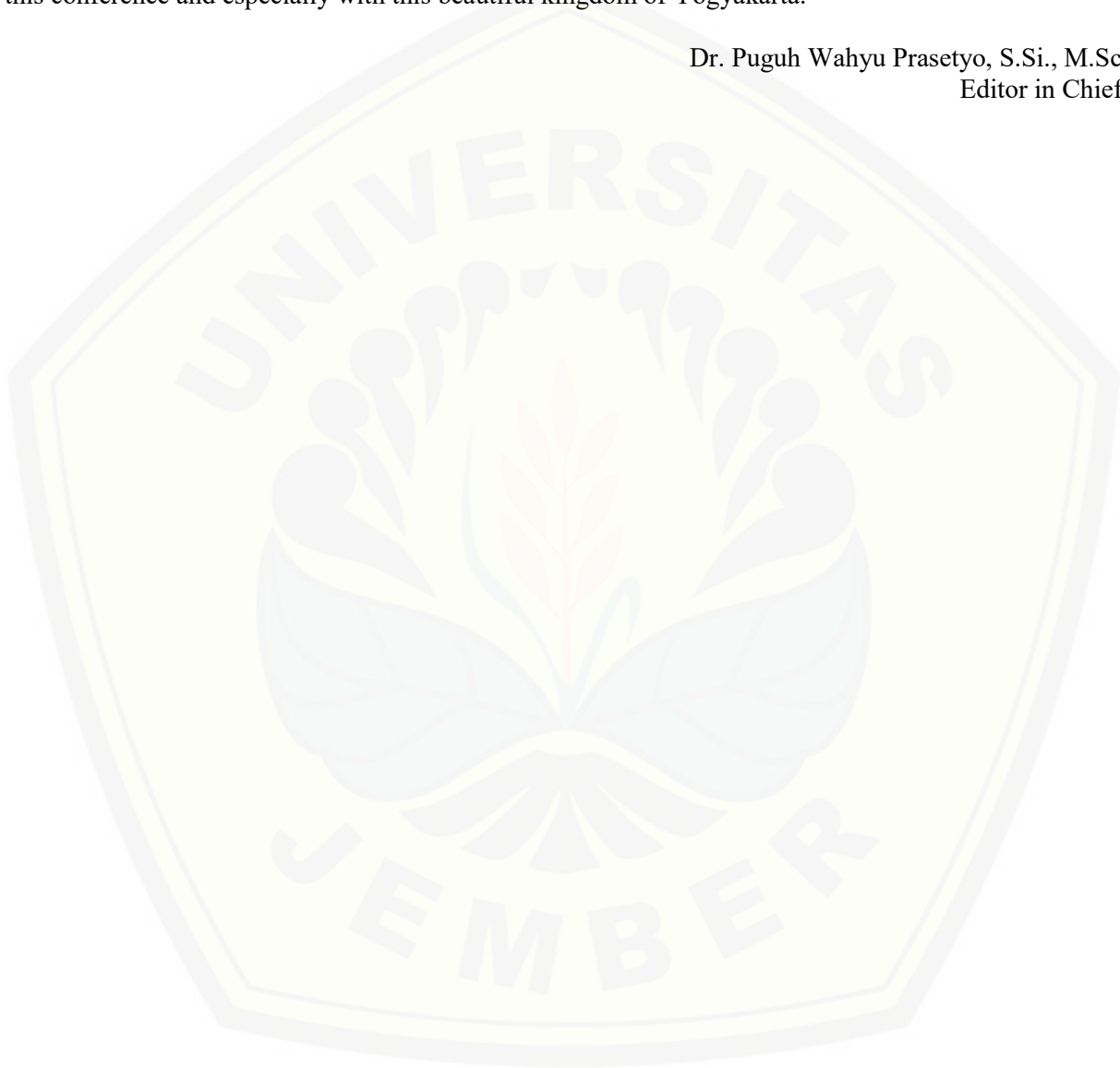
We also have speakers in workshop session coming from Universitas Ahmad Dahlan, Dr. Rully Charitas Indra Prahmana, S.Si., M.Pd who deliver the talk on the Publishing Manuscripts in a Scopus-indexed



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

Journal and M. Rizky Alif Yuza who deliver the talk on the Workshop Big Data: "Sentiment Analysis Using Python, Elastic Search and Kibana. ADINTERCOMME 2019 was an overwhelming success, attracting the delegates, speakers and sponsors from many countries and provided great intellectual and social interaction for the participants. Without their support, the conference would not have been successfully organized. We trust that all the participants found their involvement in the Conference both valuable and rewarding. Our wish is that all participants would enjoy this conference, contribute effectively toward it and take back with you knowledge, experiences, contacts and happy memories of this conference and especially with this beautiful kingdom of Yogyakarta.

Dr. Puguh Wahyu Prasetyo, S.Si., M.Sc
Editor in Chief



PAPER • OPEN ACCESS

Peer review declaration

To cite this article: 2020 *J. Phys.: Conf. Ser.* **1613** 011002

View the [article online](#) for updates and enhancements.



The Electrochemical Society
Advancing solid state & electrochemical science & technology

240th ECS Meeting ORLANDO, FL

Orange County Convention Center Oct 10-14, 2021



Abstract submission due: April 9

SUBMIT NOW

Peer review declaration

All papers published in this volume of **(Choose One) Journal of Physics: Conference Series/IOP Conference Series: Materials Science and Engineering/IOP Conference Series: Earth and Environmental Science** have been peer reviewed through processes administered by the Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

- Type of peer review: Single-blind / Double-blind / Triple-blind / Open / Other (please describe)**

All articles are double-blind reviewed by using the open conference system provided by Universitas Ahmad Dahlan. Both author and reviewer worked anonymously.

- Conference submission management system:**

The authors submitted their articles to the open conference system at <http://seminar.uad.ac.id/index.php/adintercomm>. The papers were distributed to the reviewers with double-blind review process. One paper was reviewed by two reviewers. The review results were also announced by the editor by using the open conference system. Furthermore, all accepted papers were revised by the authors and after this process, all articles were edited by the layout team to make the papers meet with the JPCS layout style.

- Number of submissions received:**

The number of all submitted papers is 137 which consist of 130 papers distributed to the reviewers and 7 papers were directly rejected because they did not meet with the requirements determined by the committee.

Number of submissions sent for review: The number of papers sent for review is 130.

Number of submissions accepted: The number of accepted papers is 83.

Acceptance Rate (Number of Submissions Accepted / Number of Submissions Received X

100): Acceptance Rate = $\frac{83}{137} \times 100\% = 60,5\%$

Average number of reviews per paper: The average number of reviews per paper is 2.



Total number of reviewers involved: Total number of reviewers involved is 37.



Any additional info on review process: The reviewers were assigned based on their expertise and research interest.



Contact person for queries: Email: puguh.prasetyo@pmat.uad.ac.id

Mobile: +62-856-2911-051



Table of contents

Volume 1613

2020

◀ Previous issue Next issue ▶

Ahmad Dahlan International Conference on Mathematics and Mathematics Education 8-9 November 2019, Yogyakarta, Indonesia

Accepted papers received: 03 August 2020

Published online: 21 September 2020

Open all abstracts

Preface

OPEN ACCESS 011001

The Preface of the Second Ahmad Dahlan International Conference on Mathematics and Mathematics Education (ADINTERCOMME) 2019

P W Prasetyo, J Purwadi, U Khasanah, S Fahmi, R C I Prahmana, A Istiandaru, F Setyawan, A Hendroanto, D Astuti, S W Priwanto *et al*

+ [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 011002

Peer review declaration

+ [Open abstract](#) [View article](#) [PDF](#)

Papers

OPEN ACCESS 012001

Automatic detection process of solar active region based on SDO/AIA digital image

I Sukarsih, A Hermawanti, Respitawulan, R Priyatikanto and E Kurniati

+ [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012002

Critical thinking ability through experiential learning in the calculus class

A A Abdullah, W N Shanti and D A Sholihah

+ [Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012003

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



HOTS problem on function and probability: Does it impact to students' mathematical literacy in Universitas Terbuka?

T D Prastiti, S Tresnaningsih, J P Mairing and A R Azkariahman

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012004

Brain based learning to improve students' higher order thinking skills

R Lusiana and T Andari

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012005

Mathematical reasoning through the application of solid geometry

H Widiatmoko, Mardiyana and Triyanto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012006

Fuzzy c-shells clustering algorithm

N B I Pratiwi and D R S Saputro

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012007

Reflective pedagogical paradigm approach in mathematics learning

T V D Saputro and A Mahmudi

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012008

Students' mathematical critical thinking reviewed from self-regulated learning

V D Susanti, I Krisdiana and F Adamura

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012009

Mathematical probability: student's misconception in higher education

D Astuti, L Anggraeni and F Setyawan

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012010

Student mathematical anxiety: investigation on problem based learning

M G Jatisunda, N Kania, V Suciawati and D S Nahdi

[+ Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).

012011

The ethnomathematics in making woven bamboo handicrafts of osing community in Banyuwangi, Gintangan village as geometry teaching material

E Yudianto, S Susanto, S Sunardi, T Sugiarti and F A Fajar

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012012

Representation skills students reviewed from the prior knowledge through realistic mathematics education in a linear material program

Laelasari, Darhim and S Prabawanto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012013

Pre-service mathematics teachers' experiences of teaching practice in function composition

N Kania, I Nurhikmayati and V Suciawati

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012014

Interactive learning media based on MySQL technology in mathematics

H Aliyah, T A Kusmayadi and L Fitriana

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012015

Flexibility in solving open-ended mathematics problems based on students' thinking styles

F Isyrofinnisak, T A Kusmayadi and L Fitriana

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012016

Solving Shortest Path Problems Using Mathematical Literacy Skill Figured Out By Pre-Service Teachers

D Apriandi, W Murtafiah, A D Ayuningtyas and H E Rudyanto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012017

Metacognition skills and higher order thinking skills (HOTS) in mathematics

U Albab, Budiyono and D Indriati

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012018

Contextual problem in mathematical problem solving: core ability in Realistic

Mathematics Education

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012019

A survey of time series forecasting from stochastic method to soft computing

P Hendikawati, Subanar, Abdurakhman and Tarno

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012020

Identification the preliminary concept of geometry through Prambanan temple artifacts

A Andriani and Marsigit

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012021

Direct identification of Borobudur temple artefacts for learning flat shapes concepts

R Anista and M Marsigit

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012022

Mathematical Reasoning and Communication in TGT Learning Model with PQ4R Strategy

A I Primadani, Mardiyana and Triyanto

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012023

Study in statistics: motivation, independence, and learning achievement

Edi Irawan

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012024

Collaborative classroom action research for mathematics and science teachers in Indonesia

F Nurhasanah, U Sukandi, A B Kuncoro, A Rusilowati, W S Hastuti and A Prabowo

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS

012025

















Students' mathematical proficiency in solving calculus problems after Maple implementation

H Hamid, N Angkotasari, A Jalal, D Muhtadi and Sukirwan

[+ Open abstract](#) [View article](#) [PDF](#)

















This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).



- OPEN ACCESS** 012026
Digital Repository Universitas Jember
 Measurement of mathematics problems solving ability using problem based mathematics question
 Zulfah, Astuti, Y F Surya, R Marta and T T Wijaya
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012027
 Exploring students' critical thinking skills in a geometry lesson
 D Hidayat and R Rosnawati
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012028
 Mathematical resilience and mathematical problem-solving ability in Junior High School
 D Attami, Budiyono and D Indriati
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012029
 Are students having trouble solving problems polyhedron?
 A N Arifah and H Retnawati
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012030
 Flipped classroom research trends in mathematics learning in Indonesia
 E Apriska and Sugiman
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012031
 How do students promote mathematical argumentation through guide-redirecting warrant construction?
 D Muhtadi, Sukirwan, R Hermanto, Warsito and A Sunendar
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012032
 Classification of genetic expression in prostate cancer using support vector machine method
 S A Komarudin, D Anggraeni, A Riski and A F Hadi
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012033
 Improvement of mathematics learning activity through lesson study
 Prisdikus, Tanjung and Jojono Munu
 + Open abstract  View article  PDF

This site uses cookies and by continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).



-
- OPEN ACCESS** 012034
 Analysis of metacognition ability in solving environmental mathematics problems
 Jeinne Mumu and Benidiktus Tanujaya
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012035
 Geogebra in integral areas to improve mathematical representation ability
 A Septian, Darhim and S Prabawanto
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012036
 Does gender affect the mathematics creativity of junior high school students?
 S D A Permatasari, Budiyo and H Pratiwi
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012037
 Reflective mathematical thinking process and student errors: an analysis in learning style
 N Ratnaningsih and E Hidayat
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012038
 p -Summable Vector-Valued Sequence Spaces in Non-Archimedean 2-Normed Spaces
 B A Nurnugroho and P W Prasetyo
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012039
 The challenge-based learning to students' spatial mathematical ability
 Wati Susilawati and Didi Suryadi
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012040
 Analysis of students' metacognition in solving mathematics problems
 I A Imaya, Budiyo and F Nurhasanah
 + Open abstract  View article  PDF
-
- OPEN ACCESS** 012041
 Augmented Reality for Integer Learning: Investigating its potential on students' critical thinking
 S Suryanti, Y Arifani and D Sutaji
 + Open abstract  View article  PDF

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



- OPEN ACCESS** [Digital Repository Universitas Jember](#) 012042
The Role of Progressive Mathematics in Geometry Learning
Warsito, D Muhtadi, Sukirwan and H Saleh
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012043
Analysis of the government district RMTDP using FMD and dematel method
D Suhaedi, A A Ishfahani, E H Harahap, M Y Fajar and O Rohaeni
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012044
Non-empirical Induction in mathematics conjecturing in the new knowledge construction
Supratman, Ratna Rustina and Yeni Heryani
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012045
Educational statistics textbooks to develop collaborative skills and critical thinking
D Astuti, A Prabowo, N A Hidayati and U Khasanah
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012046
Understanding primary school children's learning on addition of fractions
Nor'Arifahwati Haji Abbas, Masitah Shahrill and Rully Charitas Indra Prahmana
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012047
Mathematical Literacy on Rectangles And Triangles Based on The Characteristics of Students' Way of Thinking
B A Nurnugroho, Nurul Arfinanti and Ika Kartika
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012048
Mathematical statistics learning model based on the Indonesian national qualification framework
E Syahputra, E Surya and D R Utami
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012049
Self regulated learning for social cognitive perspective in mathematics lessons
N E Zakiah and D Fajriadi
[+](#) [Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site, you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



- OPEN ACCESS** 012050
Management of authentic assessment in mathematics lessons to develop 4C skills
N E Zakiah and D Fajriadi
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012051
Students' creativity level on solving mathematics problem
C A F Thohari, Budiyono and H Pratiwi
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012052
TORIQ: Android-based mobile learning for vector lessons
R A Pratama, D Larasati and H Khotimah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012053
Gender differences on students' self-regulated learning in mathematics
F M A Rohman, Riyadi and D Indriati
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012054
Mathematical literacy in pre-service elementary school teacher: A case study
V Yustitia, S M Amin and Abadi
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012055
Students' cognitive style in mathematical thinking process
M Izzatin, S B Waluyo, Rochmad and Wardono
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012056
Neuroscience study: Gender and mathematical creative thinking skills in vocational high school students
N Adiastuty, S B Waluya, Rochmad and N Aminah
[+](#) Open abstract [View article](#) [PDF](#)
-
- OPEN ACCESS** 012057
Mathematics module based on problem-based learning to improve students' metacognition
I Barokah, Budiyono and D R S Saputro
[+](#) Open abstract [View article](#) [PDF](#)



OPEN ACCESS [Digital Repository Universitas Jember](#) 012058

Geometry learning in vocational high school: Investigating the students' difficulties and levels of thinking

M E O Barut and H Retnawati

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012059

Google form in engineering mathematics: Innovation in assignment method

Iswanti, S Astuti, Suryono, I Sayekti and B Krishna

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012060

Some diagnostics learning problems on basic arithmetic skills of junior high school students

J Hernadi, A Ekayanti and Jumadi

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012061

Enhancing students' self-efficacy through metacognitive strategies in learning mathematics

M F Amal and Ali Mahmudi

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012062

Mathematical Representation Ability and Self -Efficacy

Hanifah, S.B. Waluya, Rochmad and Wardono

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012063

Batak Toba culture on mathematics learning process at Medan high school

E Surya, C Purba, E Syahputra, D Haris, Mukhtar and B Sinaga

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012064

Ensemble-support vector machine-random undersampling: Simulation study of multiclass classification for handling high dimensional and imbalanced data

Nur Silviyah Rahmi

[+](#) Open abstract [View article](#) [PDF](#)

OPEN ACCESS 012065

The visualization and classification method of support vector machine in lymphoma

cancer
This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



B C Kristina, A F Hadi, A Riski, A Kamsyakawumi and D Anggraeni

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012066

Unconstrained optimization based fractional order derivative for data classification

Dian Puspita Hapsari, Imam Utoyo and Santi Wulan Purnami

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012067

Comparison of image edge detection methods on potholes road images

Tutuk Indriyani, Imam Utoyo and Riries Rulaningtyas

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012068

Open-ended mathematics module to improve students' higher order thinking skill

S Kurniawati, Budiyo and D R S Saputro

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012069

Gender differences in junior high school students' mathematical connection in geometry

D N O Sari, Mardiyana and I Pramudya

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012070

Van Hiele's Theory: Transforming And Gender Perspective of Student's Geometrical Thinking

H Fitriyani, E Yudianto, S Mafulah, F R Fiantika and R M Hariastuti

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012071

FCM using squared euclidean distance for e-commerce classification in Indonesia

E Z Khulaidah and N Irsalinda

[+ Open abstract](#) [View article](#) [PDF](#)**OPEN ACCESS**

012072

A system dynamic of the harvesting strategies to sustain the population of squid using logistic growth model

Muhamad Safiih Lola, Wan Saliha Wan Alwi, Mohd Afiq Ramlee, Fatin Alina Zulkifli, Che Noorlia Noor, Yahya Ibrahim and Mohd Tajuddin Abdullah

[+ Open abstract](#) [View article](#) [PDF](#)

This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our [Privacy and Cookies policy](#).



- OPEN ACCESS** [Digital Repository Universitas Jember](#) 012073
Calculus for software engineering: Students' perception towards flipped classroom
S K Ummah, R D Azmi and N Shofia
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012074
Simulation of Traffic T-Junction at Cibiru-Cileunyi Lane Using SimEvents MATLAB
E Harahap, D Darmawan and F H Badruzzaman
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012075
Four-Tier Diagnostic Test Method to Identify Conceptual Understanding in Calculus
Z N Fadhilatullathifi, B Ardiyanto, D D Rahayu, T Almukholani, I Rinayah and F Rahmawati
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012076
Relational Thinking Skills of Junior High School Students and Their Relationship with Creativity in Solving Mathematical Problems
Budi Usodo, Mardiyana, Ikrar Pramudya, Sutopo and Rubono Setiyawan
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012077
Mathematical reasoning in problem-solving in three dimensions
D R Arifanti
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012078
Cooperative learning based on probabilistic thinking profile SMP Muhammadiyah 3 Mlati regency of Sleman
Abdul Taram, Y L Sukestiyarno, Rochmad and Iwan Junaedi
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012079
Project based learning to improve student learning activeness
S N Rohmah, S B Waluya, Rochmad and Wardono
[+](#) [Open abstract](#) [View article](#) [PDF](#)
-
- OPEN ACCESS** 012080
Statistics literacy: what, why and how?
N A Hidayati, S B Waluya, Rochmad and Wardono
[+](#) [Open abstract](#) [View article](#) [PDF](#)



The Development of Open-Ended Math Questions on Grade V Students of Elementary School

Yenni Fitra Surya, Zulfah, Astuti, Rusdial Marta and Tommy Tanu Wijaya

[+ Open abstract](#) [View article](#) [PDF](#)

OPEN ACCESS 012082

Analysis of secondary school mathematics teachers' pedagogical content knowledge and intended teaching in curriculum reformation

A S E Hidayat and F Setyawan

[+ Open abstract](#) [View article](#) [PDF](#)

JOURNAL LINKS

[Journal home](#)

[Information for organizers](#)

[Information for authors](#)

[Contact us](#)

[Reprint services from Curran Associates](#)

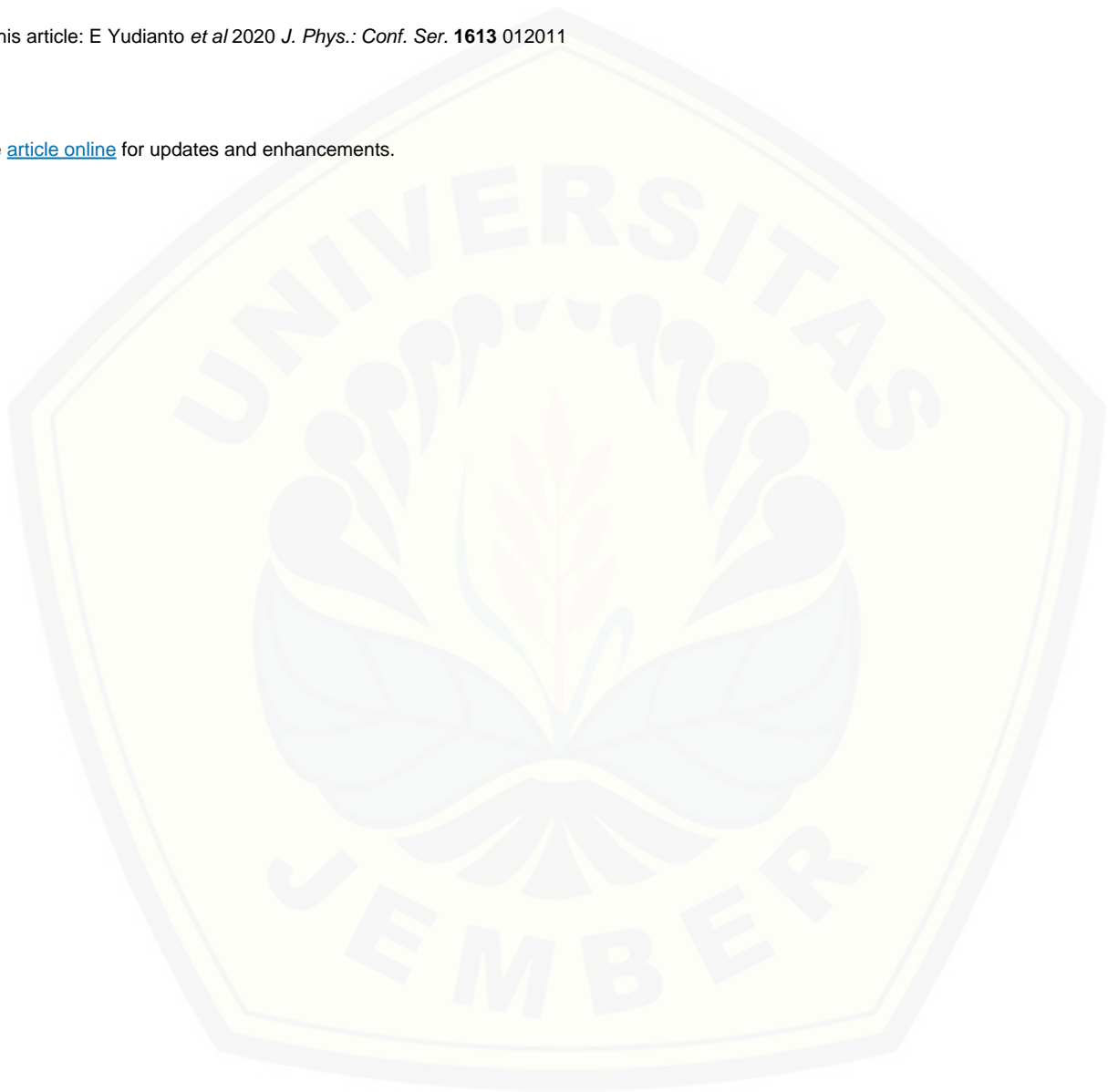


PAPER • OPEN ACCESS

The ethnomathematics in making woven bamboo handicrafts of using community in Banyuwangi, Gintangan village as geometry teaching material

To cite this article: E Yudianto *et al* 2020 *J. Phys.: Conf. Ser.* **1613** 012011

View the [article online](#) for updates and enhancements.



IOP | ebooks™

Bringing together innovative digital publishing with leading authors from the global scientific community.

Start exploring the collection—download the first chapter of every title for free.

The ethnomathematics in making woven bamboo handicrafts of osing community in Banyuwangi, Gintangan village as geometry teaching material

E Yudianto, S Susanto, S Sunardi, T Sugiarti and F A Fajar

Department of Mathematics Education, University of Jember

E-mail: erfanyudi@unej.ac.id

Abstract. Ethnomathematics refers to the application of mathematics in cultural life. This research was intended to describe the ethnomathematics in making woven bamboo handicrafts in Gintangan village, Banyuwangi. The things obtained in this research were the changes in of geometric teaching material, covering Test Problem Package with Ethnomatematics as the topic. The type of this research was qualitative research with ethnographic approach. The data collection methods used were observation and interview. The subjects of this research consisted of 2 persons; they were foremen who made the woven bamboo handicrafts, *kukusan*, *ereg*, *tenong* and *nyiru*. Ethnomathematics emerged when the woven craftsmen carried out the activities to measure, calculate and design. When the process of measuring the thickness of the bamboo whittles came, the measurement concept was meters (m). During the process of calculating the drying time of bamboo and the amount of bamboo whittles, comparative concept of value appeared. During the design process, the concept of quadrilateral and number sequences emerged. The result of this research was geometry teaching material in the form of test package. The question of test package was pointed for the students of class VIII at middle school. The question of Test Package covered 4 C5 and 1 C6 questions

1. Introduction

Indonesia is one of the largest archipelago countries in the world with five large islands and has more than seventeen thousand islands[1]. The diversity of Indonesian culture covers language, ethnicity, religion, culture, activity or custom, song, dance, and others[2]. One of tribes in Indonesia that posseses variety of cultures is Osing tribe. Osing tribe is an ancient Javanese tribe which is a native of Banyuwangi regency. As an agrarian society, Osing tribe adheres to traditional institutions that become ancestral testaments, it is related to individual life cycle and social sphere [3], One example is the relationship between the activities of woven bamboo craftsmen including *kukusan*, *ereg*, *tenong* and *nyiru* and mathematics.

The relationship between the activity and culture with mathematics is called ethnomathematics. Ethnomathematics are defined as habit used by a cultural group in mathematical activities. Mathematics is one of the subjects playing an important role in the world of education as it is one of the basic sciences in various disciplines that develops human thinking [4]–[7]. Mathematics is actually used by everyone. Mathematics and its learning make the property of



humanity as mathematics is universal [8]. Ethnomatematics was first sparked and developed by Brazilian mathematician Ubiratan D'Ambrosio. According to D'Ambrosio, ethnomatematics is the study of life patterns, habits, or habits of people in places that are connected with mathematical concepts, but are not recognized as part of mathematics by society [9].

Based on the description above, the researcher was eagered to find out more clearly about the ethnomatematics activities carried out by the makers of woven bamboo handicrafts in Gintangan Village, Blimbingsari, Banyuwangi.

2. Research Method

The research method used was qualitative with ethnographic approach. Qualitative research is a research method used to examine the natural object conditions, in which the researcher becomes a key instrument, data collection, data analysis that is inductive, and the results of research emphasizing the meaning rather than generalization [10]. Ethnography is defined as the study of life and culture of a society or ethnicity, for instance are custom, habit, law, art, religion, and language [11].

The data collection methods used were observation and interview. This research took place in Gintangan Village, Banyuwangi Regency, East Java, Indonesia. The research subjects were woven craftsmen who lived in the area. They were 2 people who worked at the craft place. People in the village of Gintangan did activities almost every day at the craft place. The environment in the village was also very good as a place to make woven bamboo handicrafts; therefore their handicrafts were quite varied.

The preliminary stage was done by determining the topic, area, and subject of the research. During the data collection method, observation and interview were carried out. The instrument validity test on the observation and interview was carried out by two mathematics education lecturers. After being validated, the observation guidelines were declared valid with the score of 2.8 while the interview guidelines were declared valid with the score of 2.75 then it was proceed to the next stage. The data collection method was done by observing the making of woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru* and interviewing the craftsmen. This research was conducted to obtain the data in accordance with the objective. The data analysis stage was grouped with the results of the research, and then the data were arranged according to the focus of the research problem and the research objective, which was to find out the mathematical elements found in the manufacture of woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru*. At the conclusion stage, the researchers drew conclusion from the results of data analysis referring to the formulation of the problem. At the stage of making geometry teaching material in the form of the question of test package, the preparation of questions was conducted based on the results of observation on the process of making woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru*. This teaching material were intended for the seventh grade students who live in Banyuwangi Regency.

3. Result and Discussion

Based on the observations on the making of woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru* and interview with two research subjects, there was ethnomatematics occurred in the process of making woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru*. Ethnomatematics that occurred in the making of woven bamboo handicrafts covering *kukusan*, *ereg*, *tenong*, and *nyiru* were based on the mathematical concepts namely the comparison of values and row numbers. This article focused on ethnomatematics in the making of woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru*. Based on the results of research on the process of making woven bamboo handicrafts including *kukusan*, *ereg*, *tenong*, and *nyiru*, ethnomatematics was obtained which included counting, measuring and

designing activities. Based on observations and interviews of the two research subjects, there was ethnomatemics appeared in the manufacture of woven bamboo handicrafts including counting, measuring, and designing activities. Ethnomatemics first appeared in counting activity. The craftsmen determined the time in the process of drying bamboo using a reference day that took approximately 1 day to dry the bamboo. Ethnomatemics appeared when craftsmen used the reference of the day in determining the process of drying bamboo, appeared mathematical concepts that was proportional relationship. The thicker the bamboo whittles, the time needed to dry bamboo was also relatively long, and vice versa, if the bamboo whittles was getting thinner, then the time needed to dry the bamboo whittles was also relatively fast. The second ethnomatemics was also seen when counting activities. The woven bamboo craftsmen when determining the amount of bamboo whittles for the *kukusan* based on the load and *itukan*, while for *ereg*, *nyiru*, and *tenong* the craftsmen used a diameter reference. Ethnomatemics appeared when craftsmen used the load reference or *itukan* on the *kukusan* and when using the diameter reference on *ereg*, *nyiru*, and *tenong*. In determining the amount of bamboo whittles on the *kukusan*, *ereg*, *nyiru*, and *tenong*, appeared a mathematical concept that was proportional relationship. The greater the load and diameter, the more bamboo whittles were needed, and vice versa, the smaller the charge and diameter, the less bamboo whittles were needed. Other ethnomatemics arose when craftsmen determined the type of bamboo that was good for making woven bamboo handicrafts. In this activity ethnomatemics arose when determining the type of bamboo that was good was the concept of measurement in the cylinder chamber. From the two research subjects it was obtained that bamboo is a structure which resembles the construction of a tube chamber.

Ethnomatemics appeared in figure 1 when the woven bamboo craftsmen determined the bamboo thickness/thinness in the process of bamboo whittling especially on the woven of *kukusan*, *nyiru*, *ereg*, and *tenong* when measuring the size of bamboo whittles. In measuring the size of bamboo whittles, volume concept appeared. Therefore, the thickness of each bamboo whittle of woven bamboo craft obtained 1.5 mm and 2 mm respectively.



Figure 1. Determining the thickness/thinness of Bamboo whittle

Ethnomatemics in figure 2 of measurement activity appeared when the woven bamboo craftsmen determined the type of good bamboo to make a woven bamboo handicrafts (*kukusan*, *nyiru*, *ereg*, dan *tenong*), measuring the thickness/thinness of the bamboo in the process of bamboo whittling. The mathematics concept appeared was measurement concept. In this case, each measurement was adjusted to the measurement to be made.



Figure 2. Slicing Bamboo

Ethnomatemics in figure 3 of design activity emerged when the woven bamboo craftsmen made the pattern of woven bamboo. In this activity, the woven bamboo craftsmen designed the

pattern of woven bamboo handicraft based in the size of the bamboo whittle. Based on the result of the observation, it was known that the pattern used was quadrilateral woven pattern had different thickness level. *Kukusan* and *nyiru* had thickness of about 1.5 mm, while *ereg* and *tenong* had thickness of 2 mm. Ethnomathematics in figure 4 when the woven bamboo craftsmen determined the pattern of woven handicraft pattern of *kukusan*, *nyiru*, *ereg*, and *tenong* by using the concept of rectangular flat shape. In the *pipil* pattern, there was a distance of each bamboo whittle and after *kukusan* and *ereg* woven bamboo handicrafts formed, there was a quadrilateral shape namely square, while in *liris* pattern there was no distance or it can be said that it was tight and after *nyiru* and *tenong* woven bamboo handicrafts formed, there was a quadrilateral shape namely square.



Figure 3. Making Woven Pattern

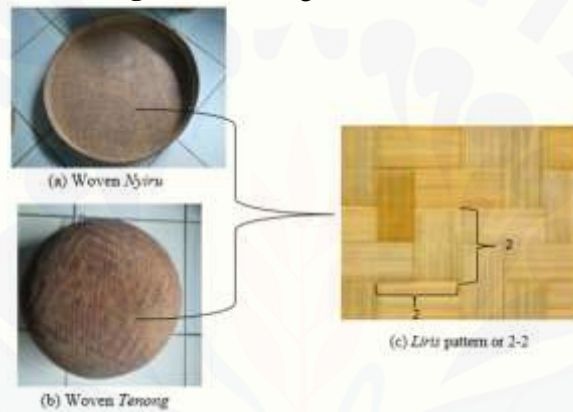


Figure 4. A Woven with *Liris* Pattern



Figure 5. A Woven with *Pipil* Pattern and the combination of Both Patterns

Ethnomathematics recognized in calculation activity could be related to the research done by Ratuanik & Kundrez. Calculation activity done by Ratuanik & Kundrez covered the calculation

of drying time of bamboo whittling. In this research, ethnomathematics emerged when the craftsmen determined the drying time of bamboo in one day and the number of bamboo whittle [9]. The way the woven craftsmen determined the dry level of bamboo whittle was various by using hour or day reference, if the weather felt to be quite hot, the craftsmen needed relative short drying time of 5-6 hours. If the weather was less hot, the craftsmen could have drying time of one day. Besides, the duration determination of bamboo drying time could be seen from the bamboo whittle thickness/thinness. This showed that the two research subjects used hour/day units in the activity of bamboo whittle drying process. In this activity, the direct proportion concept appeared, in which the thicker the bamboo whittle, the longer the time needed to dry it and vice versa. In addition, the craftsmen of woven bamboo handicrafts determined the number of the used bamboo whittle to make *kukusan*, *ereg*, *tenong*, and *nyiru* woven through a special way or reference especially for *kukusan* woven. In determining the number of bamboo whittles in *kukusan* woven, the craftsmen used load per kg reference. The bigger the shape of the *kukusan* woven, then the more bamboo whittle needed and the smaller the shape of *kukusan* woven, then the less bamboo whittle needed. To *tenong*, *ereg*, dan *nyiru* woven, the craftsmen looked at its diameter to determine the number of bamboo whittle needed. The diameter of the three woven was big so the total of bamboo whittle needed was more.

Ethnomathematics in the activity of measurement emerged in some activities of woven bamboo craftsmen. In this activity, it can be related to the research conducted by Ratuanik & Kundre. The measurement activity conducted was measuring the length of bamboo and the thickness/thinness of the bamboo whittles [9], [12]. In this research, ethnomathematics in measurement activity appeared when stating the thickness/thinness of bamboo whittle. The activity of measuring the thickness/thinness of bamboo whittle carried out by a craftsman by stating in the form of millimeters (mm) which were 1 mm, 1.5 mm, and 2 mm. In measuring the thickness/thinness of the bamboo whittle from the two research subjects there were no differences in terms of measurement. However, each bamboo craft had different thickness level. *Kukusan* and *nyiru* had a thickness of approximately 1.5 mm, while *ereg* and *tenong* had 2 mm of thickness.

Ethnomathematics in the designing activity emerged in various activities of woven bamboo craftsmen. The designing activity done by Ratuanik & Kundre and Puspawati was when the craftsmen determined the pattern of woven bamboo handicrafts[3],[9]. In this research, Ethnomathematics occurred when the woven bamboo craftsmen made the pattern of woven bamboo handicraft and determined the form of its bamboo handicraft especially crafts of *kukusan*, *ereg*, *tenong*, and *nyiru*.

When making the pattern of woven bamboo handicraft, the craftsmen used *pipil* motif on the *kukusan* and *ereg* crafts. Due to adjust with the function of *kukusan* and *ereg* crafts itself. The craftsmen also used *liris* pattern or motif on the *nyiru* and *tenong* crafts. This was also due to adjust with the crafts itself. In addition, there were uniqueness found in *kukusan* and *ereg* crafts. In these handicrafts, it found the combination patterns between *pipil* and *liris* patterns. The aim of *pipil* pattern made in both handicrafts due to adjust with the functions, while the aim of *liris* pattern made in *kukusan* and *ereg* crafts used to stick the final results of the crafts. *Liris* pattern in both handicrafts lied on the tip of the handicrafts. In this activity, the woven bamboo craftsmen did not use any references to make the pattern of the handicrafts.

4. Conclusion

Ethnomathematics in the activities of woven bamboo craftsmen done by Osing community in Gintangan village Banyuwangi. Ethnomathematics in the activities of calculating of emergence when the woven bamboo craftsmen determined time at the process of drying bamboo and determined the number of bamboo whittles to be used to make the handicrafts. In these activities, there was a concept of mathematics that was proportional relationship.

Ethnomathematics in the activities of measurement occurred when the woven bamboo craftsmen determined the kind of bamboo and the thickness of bamboo whittle. In determining the good type of bamboo and the thickness/thinness of bamboo whittle, the tools used were knife and gauge. In these activities the mathematical concept appeared that was measurement. Ethnomathematics in designing activities emerged when farmers made the pattern of woven bamboo handicrafts. When making the patterns of *kukusan* and *ereg* crafts, the woven bamboo craftsmen used *pipil* motif or pattern that were one-by-one or had a distance between the bamboo whittle to be made into a craft. In addition, the woven bamboo craftsmen also used *liris* motif or pattern in the making of *nyiru* and *tenong* crafts. *Liris* pattern was the pattern in which each of these patterns had no distance between the bamboo whittles. The making of these handicrafts patterns were related to the concept of flat shapes and geometric shapes as well as quadrilateral shape.

References

- [1] Fadlilah U, Trapsilasiwi D, and Oktavianingtyas E 2015 Identifikasi Aktivitas Etnomatematika Petani Padi pada Masyarakat Jawa di Desa Setail *J. Kadikma* **6**(3) pp 45–56
- [2] Danial E and Prayogi R 2016 Pergeseran Nilai-nilai Budaya Pada Suku Bonai Sebagai Civic Culture di Kecamatan Bonai Darussalam Kabupaten Rokan Hulu Provinsi Riau *Humanika* **23**(1) pp 61-79
- [3] Aprillianti I, Sunardi, and Yudianto E 2019 Etnomatematika pada aktivitas petani kakao desa temuasri sempu banyuwangi sebagai bahan ajar siswa *Saintifika* **21** pp 1–8
- [4] Hidayah S R, Trapsilasiwi D and Setiawan S 2016 Proses Berpikir Kritis Siswa Kelas VII F Mts . Al-Qodiri 1 Jember dalam Pemecahan Masalah Matematika Pokok Bahasan Segitiga dan Segi Empat ditinjau dari Adversity Quotient *Jurnal Edukasi UNEJ* **3** pp 21-6
- [5] Yudianto E, Suwarsono S and Juniati D 2017 The Anticipation: How to Solve Problem in Integral? *J. Phys. Conf. Ser.* **824** 012055
- [6] Yudianto E, Sunardi, Sugiarti T, Susanto, Suharto, and Trapsilasiwi D 2018 The identification of van Hiele level students on the topic of space analytic geometry *J. Phys. Conf. Ser.* **983** 012078
- [7] Sunardi S, Yudianto E, Susanto S, Kurniati D, Cahyo R D, and Subanji S 2019 Anxiety of Students in Visualization, Analysis, and Informal Deduction Levels to Solve Geometry Problems *Int. J. Learn. Teach. Educ. Res.* **18** pp 171–185
- [8] Rachmawati I 2012 Eksplorasi etnomatematika masyarakat sidoarjo *Ejournal Unnes* **1** 18
- [9] Suwito A and Trapsilasiwi D 2016 Pengembangan Model Pembelajaran Matematika SMP Kelas VII Berbasis Kehidupan Masyarakat Jawara (Jawa dan Madura) DI Kabupaten Jember *J. Ilm. Pendidik. Mat.* **4** pp 79–85
- [10] Sugiyono 2009 *Metode Penelitian Bisnis (Pendekatan Kauntitatif, Kualitatif dan R&D)* (Bandung: Alfabeta)
- [11] Kuswarno E, *Metode Penelitian Komunikasi : Etnografi Komunikasi* (Bandung: Widya Padjajaran)
- [12] Sunardi, Setiawan T B, Yudianto E, Sugiarti T, Ambarwati R and Agustin M A 2019 Ethnomathematics activities of coffee farmers in Sidomulyo Jember area as project student sheet *J. Phys. Conf. Ser.* **1321** 022124