



ISBN: 978-602-99837-4-6

# PROCEEDING

## 2<sup>nd</sup> ICMSTEA

INTERNATIONAL CONFERENCE ON MATHEMATICS,  
SCIENCE, TECHNOLOGY, EDUCATION  
AND THEIR APPLICATIONS

*"The Role of Mathematics, Sciences, Technology,  
Education towards ASEAN Economic Community and Global Challenges"*

October 3<sup>rd</sup> - 4<sup>th</sup>, 2016  
Makassar, South Sulawesi, Indonesia

FACULTY OF MATHEMATICS AND NATURAL SCIENCES  
UNIVERSITAS NEGERI MAKASSAR  
INDONESIA

PROCEEDING

*"The Role of Mathematics, Sciences, Technology,  
Education towards ASEAN Economic Community and Global Challenges"*

ICMSTEA 2016



FACULTY OF MATHEMATICS AND NATURAL SCIENCES  
UNIVERSITAS NEGERI MAKASSAR  
INDONESIA

# **PROCEEDING**

**ICMSTEA 2016 :**  
**The Role of Mathematics, Sciences, Technology, and Education Towards**  
**ASEAN Economic Community and Global Challenges**

**Makassar, South Sulawesi, Indonesia**  
**3<sup>rd</sup> – 4<sup>th</sup> October 2016**

**Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Negeri Makassar 2016**

ICMSTEA 2016: THE ROLE OF MATHEMATICS, SCIENCES, TECHNOLOGY, AND  
EDUCATION TOWARDS ASEAN ECONOMIC COMMUNITY AND  
GLOBAL CHALLENGES

**Editor** : Dr. Syafruddin Side  
Dr. Ir. Wiharto Caronge, M.Si.  
Uca, S.Si., M.Si., Ph.D.  
Iwan Dini, S.Si., M.Si.  
Ansari Saleh Ahmar, S.Si, M.Sc.  
Bustang, S.Pd., M.Sc.  
Muh. Husnul Khuluq, S.Pd., M.Sc.  
Said Fachry Assagaf, S.Pd., M.Sc.  
Sahlan Sidjara, S.Si., M.Si.  
Ahmad Ansar, S.Pd., M.Sc.  
Syamsuddin Mas'ud, S.Pd., M.Sc.  
Muhammad Isbar, S.Si., M.Si.  
Surahman, S.Pd., M.Pd.

**Editorial Assistant**

**Layouter** : Andi Ikhsan Maulana, S.Pd  
Dimas Suharto

**Cover Administrator** : Nurul Kusuma Wardani, S.Pd.

**Reviewer Board** : Prof. Alfred Edward Szmidt, Ph.D.  
Prof. Valerio Sbordon, Ph.D.  
Prof. Birgit Loch  
Dr. Richard Randriantoamanana  
Prof. Fahrul Zaman bin Huyop, Ph.D.  
Prof. Mohd. Ekhwan Toriman, Ph.D.  
Prof. Eko Hadi Sujiono, M.Si.  
Prof. Oslan Jumadi, S.Si., M.Phil., Ph.D  
Muh. Abdy, S.Si, M.Si., Ph.D  
Prof. Dr. Jasruddin M, M.Si.  
Prof. Dr. Muris, M.Si.  
Prof. Dr. Ir. Yusminah Hala, M.Si.  
Prof. Dr. Usman Mulbar, M.Pd.  
Prof. Dr. Muh. Danial, M.Pd.

Copyright © October 2016  
ISBN 978-602-99837-4-6

Diterbitkan oleh : Fakultas MIPA Universitas Negeri Makassar

# WELCOME SPEECH

## Forewords from the Chairman of Committee

*Assalamu'alaykum wa Rahmatullahi wa Barakatuh*

First of all, I wish to extend a warm welcome to fellow delegates from the various countries and regions. I realize that you are fully dedicated to the sessions that will follow but I do hope you will also take time to enjoy sparkling Makassar with its tropical setting, friendly people, and wonderful cuisine.

This 2<sup>nd</sup> International Conference on Mathematics, Science, Technology, Education, and Their Application 2016 is organized by the Faculty of Mathematics and Natural Sciences, Universitas Negeri Makassar to bring all experts and researches in these field sharing their important thoughts and findings. The conference will be held in two days from 3<sup>rd</sup> – 4<sup>th</sup> of October 2016 with two keynote speakers, seven invited speakers, and more than 80 parallel speakers from different backgrounds.

Let me take this opportunity, on behalf of the committee members, to express my gratitude and sincere thanks to the keynote, invited and all parallel speakers for spending their valuable time with us in this conference. I do hope that your time in Makassar will be valuable and memorable.

Finally, I would like to thank all steering and organizing committee for their hard work and dedication to the success of this conference. I would like also to apologize to all of you should you find any inconvenience during this event.

Thank you very much,

Wassalamu'alaykum Warahmatullahi Wa barakatuh

Chairman of Committee,

Dr. Drs. A. Mushawwir Tayeb, M.Kes.

**The 2<sup>nd</sup> ICMSTEA Speech**  
**By The Dean of Mathematics and Natural Sciences Faculty**  
**Universitas Negeri Makassar**

Your excellency Rector of Universitas Negeri Makassar  
Honorable Vice Rectors and Dean of All Faculties  
Honorable Keynote Speakers  
Distinguished all invited speakers from outstanding universities  
Distinguished all speakers and guests  
All participants,  
Ladies & Gentlement,

*Assalamu'alaykum Warahmatullahi Wabarakatuh.* My greetings for all of you. May peace and God's blessing be upon us all. *Alhamdulillah*, all praises be to the Almighty God, Allah *subhanahu wata'ala*.

It is my pleasure to welcome you all to the opening of The 2<sup>nd</sup> International Conference on Mathematics, Science, Technology, Education & their Applications (2<sup>nd</sup> ICMSTEA). I am delighted to see that the Mathematics and Natural Science Faculty has again organized the second conference that capitalize on our strength and built on our commitment to promoting Mathematics, Science, Technology and Education.

I do hope that this conference would bring a great opportunity for all of us to strengthen our contribution to the advancement of our nation.

I would like to take this opportunity to thank the conference organizing committee for their diligent work. I would also like to thank participants, especially those of you coming from abroad, for joining us and sharing your valuable experiences. Should you find any inconveniences and shortcomings, please accept our sincere apologies.

Finally, let me wish you fruitful discussion and a very pleasant stay in Makassar.

Thank you,  
Wassalamu'alaykum Warahmatullahi Wabarakatuh

Dean of Faculty of Mathematics and Natural  
Sciences Universitas Negeri Makassar

Prof. Dr. Abdul Rahman, M.Pd.

## TABLE OF CONTENTS

<b>Cover</b>	i
<b>Welcome Speech</b>	iii
<b>Table of Contents</b>	v
<b>Invited Speakers</b>	1
Genetic Structure and Evolutionary History of a Diploid Hybrid Pine <i>Pinus densata</i> Inferred from the Nucleotide Variation at Seven Gene Loci <i>Alfred Edward Szmidt</i>	1 – 8
Biodiversity and Big Data In A Changing World: From Museum Specimens to Citizen Sciences <i>Valerio Sbordonni</i>	9 – 15
Engaging Students with Tablet Technology in Science, Technology, and Mathematics Education <i>Birgit Loch</i>	16 – 38
Assesment Within Elpsa Lesson Design <i>Sitti Maesuri Patahuddin</i>	39 – 48
Why High Performance Computing (HPC) Matters? <i>Richard Randriantoamanana</i>	49 – 58
In Silico Study of L-specific dehalogenase from Rhizobial Species Strain RC1 <i>Fahrul Zaman bin Huyop</i>	59 – 68
Fostering Water Innovation: Securing the ASEAN Water Future <i>Mohd. Ekhwan Toriman</i>	69 – 78
Basic Research (in Physics) for Development of Nation Innovation <i>Eko Hadi Sujiono</i>	79 – 86
<b>Parallel Speakers</b>	
The Influence Of <i>Problem Based Learning Model</i> Toward Motivation and Physics Learning Outcomes Of Students SMA Negeri 1 Parangloe Gowa Regency <i>Muhajirin, Sidin Ali &amp; Pariabti Palloan</i>	87 – 95
Analysis of Student’s Conceptual Understanding of Mathematics on Set at Class VII SMP Frater Palopo <i>Muhammad Ilyas &amp; Fahrul Basir</i>	96 – 102

Pedagogical Content Knowledge: Teacher's Knowledge Of Students In Learning Mathematics On Limit Of Function Material <i>Ma'rufi, I Ketut Budayasa, &amp; Dwi Juniati</i>	195 – 199
Simulation Infiltration Rate of Water on Sand Media by Finite Difference Method <i>Masitah Osman, Nasrul Ihsan, &amp; Muhammad Arsyad</i>	200 – 210
The Influence Of Problem Based Learning Model Toward Motivation and Physics Learning Outcomes Of Students SMA Negeri 1 Parangloe Gowa Regency Muhajirin, Sidin Ali & Pariabti Palloan	211 – 218
The Influence of Experiment Methods on Science Process Skill and Cognitive Learning Outcomes of the X Grade Students of MIA SMAN 1 Soppeng Riaja 2015/2016 <i>A. Sri Sofializa, Muhammad Arsyad, &amp; Muris</i>	219 – 226
The Influence Of Problem Based Learning Model Toward Motivation and Physics Learning Outcomes Of Students SMA Negeri 1 Parangloe Gowa Regency Muhajirin, Sidin Ali & Pariabti Palloan	227 – 233
The Development of Critical Thinking Inventory Instrument for Biology Department Students <i>Abd Muis, Adnan Gassing, Ismail Laumma &amp; Nurjannah</i>	234 – 239
Unleash Students' Motivation with Blended Knowledge Transfer Instructional Model <i>Adnan, Sitti Saenab, &amp; Andi Rahmat Saleh</i>	240 – 243
The Development of Student's Worksheet of Physics Based on Virtual Simulation and Its Influence on Physics Learning Outcomes of Students <i>Ahmad Swandi &amp; Bunga Dara Amin</i>	244 – 251
Teaching Material Development with Challenge Based Learning (CBL) Basis to Improve Critical Thinking Ability on Human Reproduction System Material of Class XI IPA 4 Students at MAN Pinrang <i>Andi Asmawati Azis, Jasruddin, &amp; Reni</i>	252 – 258
Implementation of Accreditation Policy and Quality of Public Primary School Education Service in South-Sulawesi <i>Andi Cudai Nur &amp; Sumarlin Mus</i>	259 – 262
Plants in A Square: Explore Plants Description with QR Code Feature <i>Khalisha Azis, Wiharto, Siti Saenab, &amp; Syamsiah</i>	263 – 272
Fostering Science Learning Quality in Frame of Ecosystem Topic through Lesson Study <i>Besse Aisyah, Nurfatima, Rina Kurnia, Andi Asmawati Aziz, &amp; Andi Nurul Virninda Yusuf</i>	273 – 275
Fractionation Ethyl Acetate Extract of Stem Bark Soursop( <i>a. Muricata</i> . Linn) Potential Anticancer <i>Pince Salempa, Muharram, &amp; Iwan Dini</i>	276 – 279

**abstract**

**IMPLEMENTATION OF ACCREDITATION POLICY AND QUALITY OF PUBLIC  
PRIMARY SCHOOL EDUCATION SERVICE IN SOUTH-SULAWESI**

<sup>1</sup>Andi Cudai Nur, <sup>2</sup> Sumarlin Mus

<sup>1</sup>Universitas Negeri Makassar, Indonesia, <sup>2</sup>Universitas Negeri Makassar, Indonesia

<sup>1</sup> cudainur@gmail.com, <sup>2</sup> sumarlin.mus@gmail.com

School accreditation is the process of a comprehensive assessment of the feasibility programs and educational units, which be realized in a certification issued by an independent and professional institution. Implementation of accreditation using a comprehensive accreditation instrument was developed based on the standard that refers to the National Education Standards (NES). The purpose of this study was to understand how the reality of the implementation of coaching accreditation, schools accreditation and the quality of primary school education services in District / City of South Sulawesi. This research used a qualitative approach. Design of this research is fenomenologi, data collection is done by using in-depth interviews, observation, and documentation. To obtain valid research results, researchers used three criteria, the level of credibility, transferability, and confirmability. Accreditation assessment refers to the minimum service standards that have been set those are standard facilities and infrastructure, educators and educational standards, curriculum, educational assessment, quality assurance of education and school management. From some of the assessment indicators, standard facilities and infrastructure is one indicator that is considered to inhibit schools in getting the maximum accreditation assessment.

Keywords: Coaching Accreditation, Quality of Education Services



## **Full Paper**

### **Background**

Law Number 20 in year 2003 on National Education System, mandated that in an effort to improve the quality of national education gradually, planned and measured, the government doing school accreditation. In Article 60 on Accreditation stated that, paragraph (1) accreditation is conducted to determine the feasibility of programs and educational unit on formal and informal education at all levels and types of education; and (2) the accreditation of programs and education units carried out by an independent institution authorized as a form of public accountability.

Considering the importance of accreditation in enhancing the quality of education, the government through the Minister of Education and Culture Regulation No. 59 of 2012 forming the National Accreditation Board. In Article 1, paragraph (2) states that, the National Accreditation Board of School/Madrasah hereinafter called BAN-S/M is an independent evaluation board that establishes the feasibility of programs and educational unit of primary and secondary education levels formal which refers to SNP. Therefore, based on Regulation Minister of Education and Culture No. 1 Year 2012 on Organizational Structure and Administration of the Ministry of Education and Culture, Article 234 of the Main Duties and Functions of the Directorate of primary school among others stated that the Directorate of primary schools have a duty and function to conduct coaching accreditation of primary school and coaching equivalency education for A package. Coaching accreditation of primary schools conducted by the Directorate of elementary schools have a positive impact on the school. To learn more about this study, then we proposed this research to examine more scientifically the extent of the impact of coaching accreditation and accreditation of primary schools in providing a better education services and quality in South Sulawesi.

### **School Accreditation**

School accreditation is the school assessment activities in a systematic and comprehensive through self-evaluation and external evaluation (visitation) to determine the feasibility and performance of the school. Accreditation is a process of comprehensive assessment of the feasibility and performance of the educational unit performed as a form of public

accountability. The accreditation process in the educational unit evaluating the vision, mission, and objectives, also the efforts to achieve it based on the overall condition of the educational unit as a learning institution. Accreditation also is a device self regulation (self-regulation) in order to know the educational unit's strengths and weaknesses. (Accreditation guide, 2014)

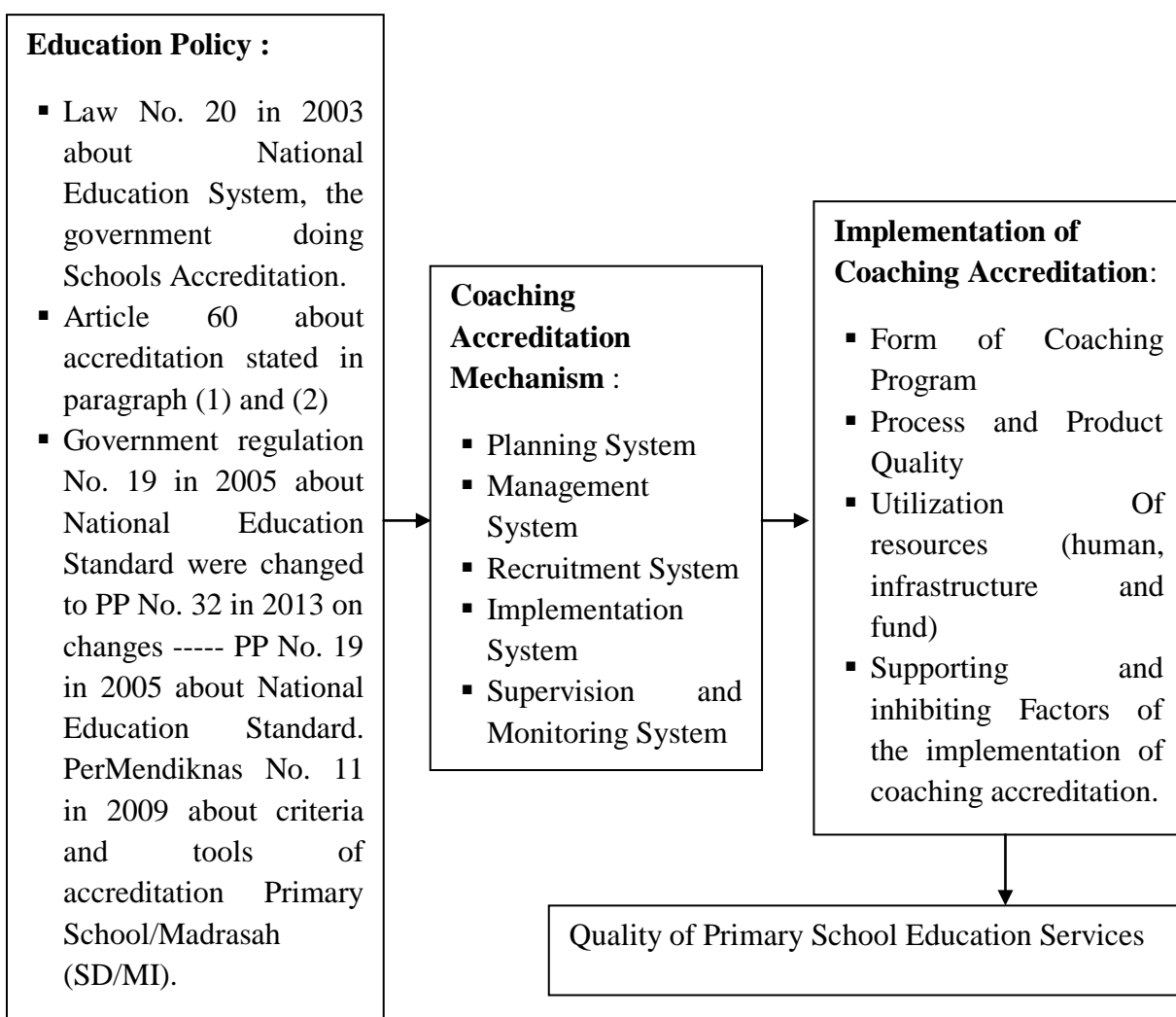
Education units can also make continuous efforts to improve and enhance their strengths and weaknesses. Assessment results in the form of a formal certification of education units condition that have been fulfill the National Standards of Education (NSE) can also be done through accreditation. Accreditation within the meaning can be interpreted as an assessment process and the development of school quality in a continuously. Accreditation within the meaning of the results declared recognition that the educational unit has met eligibility standards of education that have been determined.

### **Quality of Primary Education Services**

The quality of primary school education services can be seen in the fulfillment of Eight (8) National Education Standards, and formulated in the National Education Standards and Minimum Service Standards. SNP aspired as a minimum level of educational services. SNP contains provisions on the input, process and output are much better than current conditions. Implementation of the National Education Standards (SNP), will require enormous resources, the capacity of human resources and institutional capacity are very high for the implementation of the necessary strategy and phasing in implementation. SPM can be used as an instrument to control the implementation of the SNP gradually and programmed then the instrument's performance management needs to be done. To fulfill the quality of primary school education service it must exceed the minimum service standards (SPM) developed by focusing on services at the regional government/the ministry of religious affairs and school/madrasah, starting with developing SPM school level, then formulate their implications in the form of "SPM levels of regional government/the ministry of religious affairs which is containing the responsibility of regional governments/the ministry of religious affairs to support the implementation of SPM at the school level. SPM school level contain indicators that are part of the overall indicator of SNP which has the greatest leverage for improving the

quality. SPM prepared with a composition that reflects the input and process improvement in a balanced way by taking into the fiscal capacity of governments. SPM regional Government /the ministry of religious affairs availability, qualifications, and competence of teachers and principals; The availability, qualifications, competence of Supervisors, and the frequency of supervision; Availability Infrastructures Education. Minimum service standards at primary school level with refers to (1) Content Learning, (2) Learning Process, (3) Educational Assessment, (4) Graduates.

### Research Design and Procedures



## Research Result

Accreditation of schools/madrasah is a process of comprehensive assessment of the feasibility of an educational unit or program , the results are manifested in the form of a certificate of recognition and ranking worthiness issued by an independent and professional institution. Institutions that has full authority to conduct school accreditation is an accreditation board of the school/madrasah which is a non-departmental institutions under the auspices of the Ministry of National Education . At the provincial level, school/madrasah accreditation institution under the auspices of the Provincial Education Department .

Public Primary schools in South Sulawesi is the location of the research on school accreditation amounted to 2.737 schools . Based on the percentage of the document searches accreditation in 2015 can be seen from the table below:

**Table I. Percentage of Primary School Accreditation Levels in South-Sulawesi**

Accreditation Rank	Quantity	Percentage
A	342	12,5 %
B	1965	71,8 %
C	412	15,1 %
Not Accredited	18	0,66 %
Sum	2737	100 %

Source. BAP Provinsi Sulawesi Selatan Tahun 2015

The table above shows that the average school has been accredited in accreditation ranked B. Accreditation ranked C turns more than the accreditation A, there was even a primary school that has not been accredited. Accreditation policy that has been issued by the government and carried out every year is not yet able to maximize the accreditation significantly, it is proved by every year only a view schools accreditation has increased.

In general the accreditation assessment refers to the minimum service standards that have been set those are standard facilities and infrastructure, educators and educational standards, curriculum, educational assessment, quality assurance of education and school management. Based on the results of preliminary observations made against several schools in 4 (four) districts in South Sulawesi with each District/City have three schools with different levels of different ranks, namely accreditation A, B, and C show the schools which has accreditation A generally have fulfill / above the requirement minimum service standards that have been set,

the school that has B and C accreditation are generally not fulfill the overall requirements minimum service standards that have been established and not trying to go up to the higher ranks, proved every year they are in the same rank, and from all the various indicators above, school facilities and infrastructure indicator that inhibit school to receive maximum accreditation assessment.

From the observation, documentation, and interviews by the researchers can be describe that the accreditation rank of the school on average every year remains on the rankings or the same as in previous years, even though has made various efforts including coaching accreditation. If you see the magnitude of the education budget has been allocated by the government that there must be an increase in educational services has been done to improve the quality of school education as a comprehensive. From the juridical basis and the reality that have been found by researchers in the field indicates that there should be a new policies issued by the government in providing quality education at any educational institution.

### **Conclusions and Recommendations**

Based on the description in the preceding discussion, it can be concluded that the school's accreditation policy not provide maximum impact for the schools in providing education services to the society. As a follow up of the results / findings of the observation / observation of the target schools then suggested to the government, both central and regional governments that we need to revise the system of accreditation / instrument accreditation of schools, allocation of appropriate financing primarily the fulfillment of financing facilities / infrastructure and improving the quality of the assessors school accreditation in performing their duties.

### **Bibliography**

- Panduan Umum Pelaksanaan Bimtek Akreditasi Sekolah Dasar 2014. Direktorat Pembinaan Sekolah Dasar; Jakarta
- Panduan Umum Pelaksanaan Workshop Akreditasi Sekolah Dasar 2014. Direktorat Pembinaan Sekolah Dasar; Jakarta
- Undang-undang nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional PP Nomor 32 Tahun 2013 tentang tentang Standar Nasional Pendidikan
- Edward Sallis, 2010. *Manajemen Mutu Terpadu Pendidikan (Peran Strategis*

- Pendidikan di Era Globalisasi Modern*. Yogyakarta: IRCiSoD.
- Engkoswara dan Aan Komariah, 2010. *Administrasi Pendidikan*. Bandung: Alfabeta.
- Ivancevich, John M., Robert konopaske, Michael T. Matteson, 2005. *Perilaku dan Manajemen Organisasi* Jilid 1. Jakarta: Penerbit Erlangga.
- Tilaar. H. A. R. 2004. *Manajemen Pendidikan Nasional*. Bandung: Remaja Rosdakarya.
- Teece, D. J., 1992. Competition, Cooperation, and Innovation: Organizational Arrangements for Regimes of Rapid Technological Progress. *Journal of Economic Behavior and Organization*.