2nd International Conference on Statistics, Mathematics, Teaching, and Research 2017

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

WELCOME SPEECH
Forewords from the Head of Committee

Assalamu Alaikum Warahmatullahi Wabarakatuh.
The honourable, Rector of Universitas Negeri Makassar (UNM) and all Vice Rectors, the Dean of Mathematics and Natural Sciences Faculty and all Vice Deans, all invited Speakers and Participants.

First of all, let us praise and thank to Allah Subhana Wata'ala, because his Blessings and Helpings, we are able to gather here to attend this conference.

Second, I would like to give our welcome to all delegates, speakers, and participants coming today in The Second International Conference on Statistics, Mathematics, Teaching and Research 2017 (2nd ICSMTR-2017) "Advanced Research for Statistics, Mathematics, Sciences and Education for Enhancing International Publications" organized by Mathematics and Natural Sciences Faculty, UNM.

This conference is conducted in two days from 9th to 10th of October 2017 in Grand Clarion Hotel Makassar. It involves: a keynote speaker, six invited speakers and approximately 300 parallel speakers coming form the West to East Indonesia and several countries.

Ladies and gentleman as, I previously said, the conference proudly invites keynote speaker and six invited speakers coming from several countries. Therefore, on behalf of the committtee, I would like to express my sincere thanks to them, specifically: 1) Directorate General of Research and Development Strengthening, Ministry of Research, Technology, and Higher Education; 2) Prof. M. Shaheed Hartley (University of Westen Cape, South Africa); 3) Prof. Ahmed A. Bahnassy (King Fahd Medical City, Saudi Arabia); 4) Prof. Madya Dr. Ahmad Johari Bin Sihes (Universiti Teknologi Malaysia, Malaysia); 5) Prof. Dr. Khairil Anwar Notodiputro, MS (Bogor Agricultural University, Indonesia); 6) Abbas Panakkal, Ph.D (Ma'din Academy Research Center and International Study, India); 7) Prof. Hamzah Upu, M.Ed. (Universitas Negeri Makassar, Indonesia) and 8) Prof. Muhammad Arif Tiro, Ph.D. (Universitas Negeri Makassar, Indonesia).

Next, I would like thanks to all sponshors and also thanks to all organizing committee who have been showing very good work and determination for the accomplishment of this conference. All of them working since the beginning of the planning stage and they are still here today for all of us, even though, they are very busy with their personal responsibilities.

On this occasion, I would like to apologize to all of you when there are some inconvenience during the conference.

Finally, I would like thanks to the speakers and participants listed in the 2nd ICSMTR 2017. Have a nice conference and also that you have a very pleasant stay in Makassar city. Thank you very much for attention. Assalamu Alaikum Warahmatullahi Wabarakatuh.

Head of Committee,

Prof. Dr. Syafruddin Side, M.Si.

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

Forewords from the Dean of Mathematics and Natural Sciences Faculty, Universitas Negeri Makassar

Your excellency Rector of Universitas Negeri Makassar
Honourable 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 2nd International Conference on Statistics, Mathematics, Teaching, and Research (2nd ICSMTR). I am delighted to see that the Mathematics and Natural Sciences Faculty has again organized the second conference that capitalize on our strength and built on our commitment to promoting Mathematics, Science, Teaching and Research.

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.

Forewords from Rector of UNM

Bismillahirrahmanirrahim
Assalamu'alaikum Warahmatullahi Wabarakatuh

Your respectable, the high officials of State University of Makassar, the committee, the speakers, and the participants of conference.

It gives me great pleasure to extend to you all a very warm welcome, especially to our keynote and invited speakers who have accepted our invitation to convene the conference. ICSMTR is one of our educational activities that covers a wide range of very interesting items relating to statistics, mathematics, teaching and research.

By taking participation of this conference, it is highly expected to all of us to share our research findings to society and continuously develop new ideas and knowledge. Those things are two significant steps in improving the quality of nations around the world, increasing our familiarity to each other, and even avoiding underdevelopment.

Furthermore, I would like to take this opportunity to express my heartfelt gratitude to all organizing committee for Faculty of Mathematics and Natural Sciences that primarily hosts this conference.

Finally, this is a great time for me to declare the official opening of the International Conference on Statistics, Mathematics, Teaching, and Research (ICSMTR) 2017.

I wish you a very enjoyable stay in Makassar
I warmly welcome you again, as in Makassar, we say "salamakki battu ri mangkasara"

Wassalamu'alaikum Warahmatullahi Wabarakatuh.

Prof. Dr. Husain Syam, M.TP
Rector of Unversitas Negeri Makassar

CONFERENCE SCHEDULE
The 2nd ICSMTR
Faculty of Mathematics and Natural Sciences
Universitas Negeri Makassar

Clarion Hotel, Makassar, Indonesia, 9 – 10 October 2017

Day 1: Monday, 9 October 2017		
07.00 – 08.00	Registration	Jasmine Hall
08.00 – 09.00	Opening Ceremony Traditional Dance Doa National Anthem: Indonesia Raya Welcome speech: a. Head of Committee Prof. Dr. Syafruddin Side, M.Si. b. Dean of Math & Natural Sciences Faculty Prof. Dr. Abdul Rahman, M.Pd. c. Rector of Universitas Negeri Makassar Prof. Dr. Husain Syam, M.TP.	Jasmine Hall
09.00 – 09.45	Keynote Speaker Directorate General of Research and Development Strengthening, Ministry of Research, Technology, and Higher Education	Jasmine Hall
09.45 – 10.00	Coffee Break	Jasmine Hall
10.00 – 12.00	Invited Speakers 1. Prof. M. Shaheed Hartley, Ph.D. 2. Prof. Dr. Hamzah Upu, M.Ed. 3. Prof. Madya Dr. Ahmad Johari Bin Sihes	Jasmine Hall
12.00 – 13.00	Lunch & Pray	
13.00 – 15.30	Parallel Sesion 1	Parallel Rooms

15.30 – 16.00	Coffee Break	Parallel Rooms
16.00 – 18.00	Parallel Session 2	Parallel Rooms
Day 2: Tuesday, 10 October 2017		
08.00 – 10.00	Invited Speakers 1. Prof. Dr. Khairil Anwar Notodiputro, M.S 2. Prof. Ahmed A. Bahnassy, Ph.D. 3. Prof. Muhammad Arif Tiro, Ph.D. 4. Abbas Panakkal, Ph.D.	Jasmine Hall
10.00 – 10.10	Coffee Break	Jasmine Hall
10.10 – 11.30	Parallel Session 3	Parallel Rooms
11.30 – 12.00	Closing Ceremony	Jasmine Hall
12.00 – 13.00	Lunch & Pray	
13.00 – End	City Tour	

INVITED SPEAKER SESSION

Day 1: Monday, 9 October 2017		
10.00 – 12.00	Professor M.Shaheed Hartley, Ph.D. University of Western Cape, South Africa *Training, supervision and mentorship on a professional development journey from 2010 to 2017: A reflection by students and supervisors*	Jasmine Hall
	Professor Dr. Hamzah Upu, M.Ed. Universitas Negeri Makassar, Indonesia *The Effectiveness of Mathematics Learning Packages Based on Bilingual Approach.*	
	Professor Madya Dr. Ahmad Johari Bin Sihes Universiti Technology Malaysia, Malaysia *Transformation of Higher Education Curriculum to Meet the 4th Industrial Revolution Challenges*	
Day 2: Tuesday, 10 October 2017		
08.00 – 10.00	Professor Dr. Khairil Anwar Notodiputro, M.S Bogor Agricultural University, Indonesia	Jasmine Hall
	Professor Ahmed A. Bahnassy, Ph.D. King Fahd Medical City, Saudi Arabia	
	Professor Muh. Arif Tiro, Ph.D. Universitas Negeri Makassar, Indonesia *National Movement for Statistical Literacy in Indonesia: An idea.*	
	Abbas Panakkal, Ph.D. Ma'din Academy Research Center, India *Technological Trajectories and Epistemological Paradigms in Social Science Researches.*	

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

INVITED SPEAKERS' ABSTRACTS

Training, Supervision and Mentorship on a Professional Development Journey from 2010 to 2017: A Reflection by Students and Supervisors

Shaheed Hartley

Science Learning Centre for Africa, University of the Western Cape, South Africa

Abstract

The poor results of learners in the high school exit examinations have been a point of debate for many years in South Africa. The negative cycle of science and mathematics outcomes by learners are compounded by many national and international benchmark tests conducted over the past 20 years which describe a dire view of the country's education system. In attempt to address this challenge, many of the provinces in the country have advanced a number of strategies in this regard. This study represents one of the interventions that the education department of the Eastern Cape Province implemented. The Science Learning Centre of the University of the Western Cape was invited to provide training to their science teachers in the form of a structured course called Advanced Certificate in Education (ACE) conducted on a part-time basis in 2010 and 2011. The course was directed at improving teachers' content knowledge, pedagogical strategies and practical and experimental skills. A total of 41 of the original 50 science teachers completed the course. As part of their continuous professional development, 31 science teachers enrolled for BEd Hons in science education in 2013 and 29 of them completed the course in 2014. These students graduated in 2015. Of the 29 BEd Hons students who completed the course 25 registered for Masters in Science Education and were joined by an additional 2 students. This paper reflects on the training, supervision and mentorship provided to educators as students of science education. The growth and development of students through their own reflection and understanding as well as through the eyes of the lecturers and supervisors that took part in the training provide the evaluation of the professional development process over the past few years. This study attempts to identify the merits, challenges and limitations of this project and the lessons to be learnt on such projects.

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

The Effectiveness of Mathematics Learning Packages Based on Bilingual Approach

Hamzah Upu

Mathematics Department, Faculty of Mathematics and Science, State University of Makassar, hamzahupu@gmail.com

Abstract

The specific targets of this research were to produce; (1) Student book (SB), (2) Student Worksheet (SW), (3) Lesson Plan (LP) and to (4) Know their effectiveness of learning packages themselves. The development design of the packages was the modification and adaptation of Four-D model (Thiagarajan, 1974), which is encompassing four phases namely; Define, Design, Develop, and Disseminate. The criteria, used as the references of Bilingual Method, refers to; (1) Indonesian Qualification Framework (IQF), based on President Regulation No. 20/2012, (2) English as a language, in which the packages were made, (3) The validators are native speakers, (4) The structure of the learning packages, which can lead students' paradigm, insight, and knowledge to worldwide things. The research finds that: (1) Quantitatively, the learning packages are generally effective to improve students' achievement, specifically shown by the increase of students' grade from the pretest to posttest as many as 8.16 in 100-grading scale and, (2) Qualitatively; (a) the development SB emphasizes on three facets namely; the clarity and the structure of the content, the language, and the problem solving, (b) The development of SW emphasizes on three primary aspects namely; the task direction, the order of the task, and the language (c) The development of LP emphasizes on four primary aspects: formulation of basic competency, time allocation, learning material, and its structure.

***Keywords*:** Effectiveness, Learning Packages, International Standard

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

Transformation of Higher Education Curriculum to Meet the 4th Industrial Revolution Challenges

Professor Madya Dr. Ahmad Johari Bin Sihes

Universiti Technology Malaysia, Malaysia

Abstract

A significant change in human life over the past 100 years has been a challenge to the world of education. The changing educational landscape witnessed some important trends such as the development of postgraduate higher education level, diversity of students and continental cross-movements in search and expanding knowledge. Education, as a whole, also impressed with the end of the 20th century and the beginning of the 21st Century. The long-standing university in power and the expansion of knowledge has been suggested to act swiftly to take account of major changes. This is necessary to make higher education more relevant to provide the necessary human capital in the future. Current education is seen as something that does not meet the needs of the job. The need to take into account the various perspectives in the curriculum is an approach that is often addressed in discussions and studies in relation to the present curriculum. The 21st Century Learning has been suggested as a result of educators, educators and industry experts in identifying the skills needed to succeed in life, employment and support systems that should be the core of learning outcomes. The Future of Jobs report estimates that more than 1/3 of the jobs considered important today will change over the next five years. Advanced robotics and automated transport, artificial intelligence and advanced materials, biotechnology and genomics are a revolution in life. The advanced development that transforms lifestyle will create unexpected jobs and eliminate today's popular career. This change will have a profound impact on higher education. The rapid movement and development of knowledge has transformed teaching and learning. And this is expected to be more serious when the world is facing a rapid change in technology. Automation in the workplace will make the skills of automated assisted and system-assisted work critical regardless of any job field. The Phenomenon of the 4th Industrial Revolution is seen to give a greater challenge to higher education. In this regard, education needs to be able to produce individuals capable of exploring and possessing sophisticated analysis and even solving complex problems. At the same time, higher education needs more flexibility and innovation to enable lifelong learning. Higher education in the 4th Industrial Revolution (4IR) is seen as something complex but it is a chance to transform society. Artificial intelligence drives 4IR which emphasizes various disciplines in teaching, research and innovation. With human sophistication and wisdom, the gap between humanity and social science and science and technology can be diminished. The 4th Industrial Revolution triggers a new phenomenon in the life of a universal human being. University and society collaborations in addressing the real problems of life are very important. Universities and communities need to jointly develop a higher education curriculum to be more relevant. Higher education must take into account the needs of the 4IR to ensure that the academic programs are sustained and relevant. In this regard, the forming, formulation and review of curriculum based on the criteria that are specific and agreed upon is necessary to humanizing 4IR so that physical and moral progress will go hand in hand.

***Keywords*:** Effectiveness, Learning Packages, International Standard

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

National Movement for Statistical Literacy in Indonesia: An Idea

Muhammad Arif Tiro

Department of Statistics, Universitas Negeri Makassar, 90222, Indonesia, arif_tiro@yahoo.com

Abstract

The national movement of statistical literacy in Indonesia needs to be initiated and implemented. It is important to realize the noble ideals of the Indonesian nation to educate the nation's life. We cannot avoid reading statistical data presentation. Reading newspapers, magazines, and other papers will undoubtedly always find data presentation. Moreover, if we read scientific papers it is very difficult to avoid the presentation of data, both in the form of descriptive statistics and even in the form of inferential statistics. The need for the ability to read and interpret statistical data is not limited to a particular community, but to almost all communities within the nation. Therefore, the idea to promote the national movement of statistical literacy in Indonesia is presented in this conference forum.

Keywords: information literacy, statistical literacy, descriptive statistics, inferential statistics, nation's life

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 011001 doi:10.1088/1742-6596/1028/1/011001

Technological Trajectories and Epistemological Paradigms in Social Science Researches

Dr. Abbas Panakkal
ICD, Nathan Campus, Griffith University, Australia

Abstract

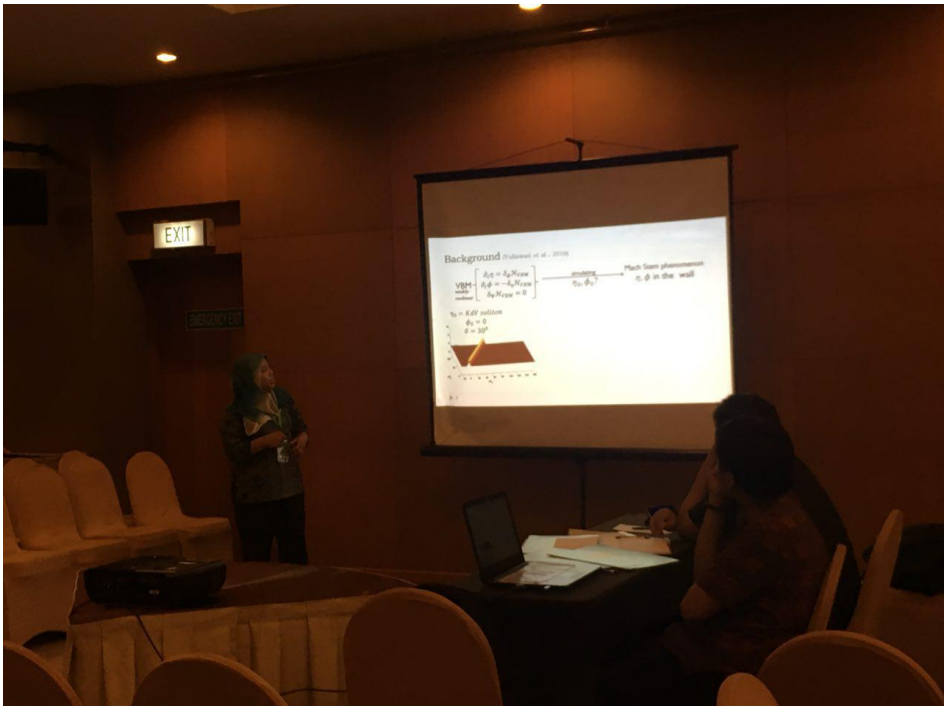
It is very important to analyse how the new technological advancements influenced the academic writing expectations in HDR (Higher Degree Research) level. Embracing technological advancements, new researchers and supervisors drive well beyond the standard methodological manual or stylebook, which were the manifest of research for centuries and one third of the research time was spent to tame various modes and methods. In social science research all the big questions (who, what, why, where) are still existed, but most of them are gently answered by the smart software, which were officially adopted by top listed universities around the world. Technology scientifically reaffirms the elements, which in principle assure original writings and significant contributions to the knowledge and understanding. The EndNote software offers wonderful arena of styles in a single mouse click and enables to transform the whole article to the any international style. There are number of online tutorial aides from focal universities and the thesis can be checked with the help of software whether it is clearly articulated, logically presented with accurate references and sound arguments. Tara Brabazon online materials are examples of bundle of information for current doctoral students and supervisors by Times Higher Education. Academic institutions also offer online resources with instructions and examples of accepted type of research style and techniques. Reflections of evolving novel technologies in the field of Higher Degree Research are well identified and clearly accepted in the current social science research world. The real purpose of adopted technologies are to ease problems of drafting procedures, mode of writing and systems of citations.

This also helps supervisors, internal and external examiners to affirm the authenticity of cited manuscripts, articles, books and implications of different perspectives on how researches were designed, conducted and narrated. The result of this technological advancement and its effective use bring a novice and progressive mode of research and keep an outlook on how technology can be used for the betterment of intellectual, scientific phenomena of social science research. This paper focuses on wonderful tools and platforms developed by timely educationalists that bridges the methodological gap and reconsiders important epistemological questions, which are often overlooked.

Opening Ceremony

Presented by Abbas Panakkal

Parallel Session


EXIT
Background


Makassar 09 Oct 2017


Clarion Hotel & Convention Makassar 09 Oct 2017


Grand Clarion Hotel & Convention Makassar 09 Oct 2017


Keynote Speaker
Invited Speakers

The Portrait of Madrasah Aliyah In Indonesia: A Critical Evaluation of the Mathematics Score in the National Examination

IOP Conf. Series: Journal of Physics: Conf. Series **1028** (2018) 012126 doi:10.1088/1742-6596/1028/1/012126

The Portrait of Madrasah Aliyah In Indonesia: A Critical Evaluation of the Mathematics Score in the National Examination

Kusaeri

Universitas Islam Negeri Sunan Ampel, Surabaya, Indonesia

kusaeri@uinsby.ac.id

Abstract: Madrasah Aliyah (MA) or Islamic senior high school as a part of the national education system plays a big role in advancing the education in Indonesia. There are 7,260 MA institutions with 1,294,776 students. The big potential of MA must be accompanied by some efforts to improve the quality. One of the ways is by capturing and evaluating the quality of MAs through, for example, the results of the National Examination (NE). This study aims to capture the mathematics achievements of students of public MAs and private MAs (mathematics and natural science study stream and social science study stream). The population of the study is all of MA students in Indonesia who took the NE in 2016, with a sample of 291,972 students from 1,455 MAs across 38 districts/cities in East Java. The data of this study are the mathematics scores from the NE and the National Examination Integrity Index (NEII) 2016. The data were analyzed by: (a) determining the average of mathematics scores for each group of MAs (public and private MAs), (b) comparing the average of NE mathematics scores between groups, (c) determining the classification of the MAs based on the number of students and the regions, and (d) comparing the average of 'mathematics scores' in NE with the average scores of NEII for each of MA classification types. The results show that the mathematics achievement of public MA students is higher than the private MAs (for both study stream groups).

1. Introduction

Madrasahs or Islamic schools, first entered Indonesia in the late 18th century brought by the Middle East alumni. They wanted to reform Islamic education by adopting the reform in Al-Azhar University Cairo, offering a curriculum that provides general lessons in addition to religious lessons as its primary mission [1]. This offer was in response to the number of schools established by the Netherlands with the European education system. If Dutch schools were specifically offered to the children from the nobel families and Dutch government officials [2,3], the madrasahs were present as an effort to provide education for the poor families at that time [4].

The existence of madrasahs in Indonesia is unique and is always interesting to be studied. From the management aspect, about 90% of madrasahs are run by the community (private/ foundation) while the majority of public schools (95%) are managed by the government [5]. As the madrasahs are mainly managed by the community, each madrasah has its distinct characteristics in terms of the curriculum, the teaching staffs and some other aspects [4]. The dominant role of the community in the management of madrasahs often results in the low availability of the funds used to run the madrasahs

[6]. It is common that madrasahs are often left behind compared to public schools. The community recognizes madrasahs as second-class or suburban schools. This perception is held not only in Indonesia, but also in Pakistan and Bangladesh [7].

However, in the last 10 years, Indonesia madrasahs have experienced significant development, both in terms of the quality and the quantity. Madrasahs have made many achievements both in the national and international levels. Madrasahs' students win various National Science Olympics and international Olympics. This proves that the quality of madrasahs at present is well comparable to public schools (both owned by the government and by private foundation).

The above facts have indirectly affected the public perception and the image of madrasahs. People's trust to madrasahs is growing positively. In fact, the number of madrasahs and students continue to rise, from 60,231 institutions in 2008 to 77,336 institutions in 2016. The number of students also follows this trend, from 7,073,370 at the end of 2008 to 9,252,437 in 2016 or increased up to 76.45% in 8 years [5].

A number of studies on madrasahs, have been widely conducted not only by academics from Indonesia but also from other countries. The studies can be divided into three major groups. The first group is studies that focus on madrasah historical reviews. Research in this group began to intensify since the attack on the twin towers of World Trade Center (WTC) New York, September 11th, 2001. Since then, the Western researchers have been interested in and paying more attention to the education system of madrasahs and pesantrens [7].They want to explore the curriculum of madrasahs and pesantrens. This is because since the 9/11 incident many parties have accused Islam as the actor behind the incident. Madrasahs and pesantrens are suspected of being the strategic institutions in implanting the radical Islamic ideology to Muslim youth [8]. Researchers [9-13] are among those included in this group.

The second group of researchers is those who pay attention to the problem of madrasahs management. Madrasahs with all their limitations bring many problems including limited budgets, low in the quality of student input, underqualified teachers and limited learning facilities. Each researcher has different attention to the problems faced by madrasahs. Some researchers are also interested in the possible ways to do the transformation to minimize the limitations of madrasahs. The complexity of the problems faced by madrasah has attracted some researchers [3,14,15].

The third group includes those who are concerned with madrasahs' achievement such the research conducted by the World Bank that studied the effect of school types (public senior high school/SMP and Islamic senior high school/MTs) on student achievement [16]. Using the National Examination (NE) scores, the research compared the levels of ability among the students. There were also studies on the skills of students from madrasahs and public schools in Bangladesh [17]. They compare mathematics achievements between female and male students. Furthermore, there was a more focused research capturing the ability of Indonesian students by relating it to the results of National Examination [1]. The ability captured include math, science, Bahasa Indonesia and English. The study took the subjects of NE test takers from MTs (Islamic junior high schools) across Indonesia, which were divided into 3 zones: the West (Sumatra and Kalimantan), Java and the East (covering Bali, Nusa Tenggara, Sulawesi, Maluku and Papua).

The above studies do not seem to have clearly captured the mathematics achievement of MA students in Indonesia. Also, the studies have not considered the distinctiveness of each group of madrasahs. In other words, there are questions of whether the similarities or differences (if any) in mathematics achievement between different groups of MAs do reflect the actual condition and whether there are other factors that cause the similarities or differences. These issues need to be explored through a comprehensive, thorough and careful analysis to get more conclusive findings. Thus, efforts to improve the quality of madrasahs in general and the MAs in particular, can have a clearer direction as to identify which MAs need more support in terms of policy.

1.1. Research Focus

This research focus to capture the mathematics achievements of students of public MAs and private MAs (mathematics and natural science study stream and social science study stream).

2. Methodology of Research

This study took the data from the NE scores in 2016 collected from the NE Results Report released by the Center of Education Assessment, Ministry of Education and Culture of Indonesia. The data of the NE scores are corroborated with the NEII data. NEII is an illustration of the level of honesty in answering NE questions, obtained from the analysis of students' answer patterns in doing NE. Good NEII reflects the quality of the learning process and the real ability of NE test takers; the process and ability which in turn will result in good achievement. On the other hand, bad NEII can result high achievement but it is pseudo because it does not reflect students' real ability. These data were also obtained from the Ministry of Education and Culture.

2.1. Sample of Research

In 2016, there were 1,294,776 MA students taking the NE, spread over 7,843 institutions [6]. Of the total MA, approximately 20.04% or 1,572 MAs are in East Java with a total of 291,972 students. This figure indicates that East Java is the province with the highest number of MAs and MA students in Indonesia. Based on this consideration, East Java was selected as the research sample.

2.2. Procedures

The mathematics scores of NE, which have been processed using software, presented in the form of "statistics," "graphics" and "absorption." The software enables the researcher to easily access the required data. The statistics contains information on value, mean, highest and lowest scores, standard deviation and the distribution of students' scores. The graph presents information on the average of students' mathematics scores in a madrasah in comparison to the average scores in the district, provincial and national levels. The absorptive capacity contains information on students' ability on tested subjects in each madrasah, district, province and nationally.

2.3. Data Analysis

The data were analyzed in the following stages. First, the average mathematics scores of each MA group (state MAs and private MAs) were searched in software. In this stage, the MAs were also categorized based on the study stream groups, namely the stream of Mathematics and Natural Science (MIPA) and Social Science. Second, the average values of mathematics scores from NE across the groups were compared (among state MAs and private MAs with MIPA and IPS study streams). The same way was done for the excellent MAs (MA Unggulan). Third, the MAs were classified based on the number of students (small MAs, medium, and large) and the region (region of Madura, Tapal Kuda region and other regions). Fourth, the average mathematic scores of both types of classification of MAs were compared to the average of NEII.

3. Results and Discussion

In NE 2016, the subject of mathematics was tested in all groups of study streams in MA including MIPA, IPS or Language and Culture study streams. However, due to the small number of MAs in East Java that offer Language and Culture study streams, this paper does not discuss the NE mathematics achievements of the group.

The number of private MAs in East Java for MIPA study stream is bigger than that of public MAs. The data indicate that the average mathematics score of MIPA students in private MAs (60.22) is lower than that of public MAs (62.59) with the standard deviation of private MA students (19.73), which is higher than that of public MAs (13.90). This signifies the broad disparity of quality between private and public MAs.

A similar pattern also occurs in the IPS study stream. In this group, the average mathematics score of private MA students is 1.04 points lower than that of public MAs. The standard deviation value of private MA students is also higher than that of the students of public MA, that is 19.65 compared to 13.27. The above facts are specifically interesting to be explored and studied further.

The real condition MAs shows that private MAs mostly have limited funds and various other limitations. These limitations of private MAs greatly affect the condition of the infrastructure supporting the students' learning. With this condition, it is extraordinarily surprising that students from private MAs have higher achievement in mathematics compared to those from public MAs.

One kind of private of MAs worth observing is excellent MAs (MA unggulan). MAs of this type has several advantages in many ways compared to other private MAs, including in the learning process. In East Java there are 10 MAs Unggulan offering MIPA study streams and 15 MAs offering IPS study streams, spread in various districts/cities. In general, the average value of students' mathematic scores from excellent MAs' is 67.63 for both study streams. With this average, the MA Unggulan group's achievement is not far behind the achievement of private MAs in general. In other words, there is a negation on the assumption that the scores from MA Unggulan contribute to the small difference in the average scores between private and public MAs.

It is also important to explore further another important aspect in interpreting the NE results; that is the credibility level of the test administration. The credibility of the administration of the NE can be seen from the index in NEII. Figure 1 presents the comparison of the average results of the NE with NEII. There is a broad disparity between the average of the results of the NE and NEII in small private MAs (MA with less than 33 students in 1 class). This means that the results of the NE for small private MA groups need to be further explored because it is very possible that the high average is obtained not from the results of the students themselves.

The small difference of achievement among the students of private MAs and public MAs raises a suspicion that there is a contribution of pseudo performance of this group of small private MAs. The various limitations of small private MAs make it difficult for small privat MAs to conduct good quality learning process. Under such conditions, teachers, students and other stakeholders at the institutions compromise and together they commit a fraud. For them, NE's result has a very strong impact to their image. The fraud that they do is an effort to maintain a good name, even improve the image of the MAs in society [15]

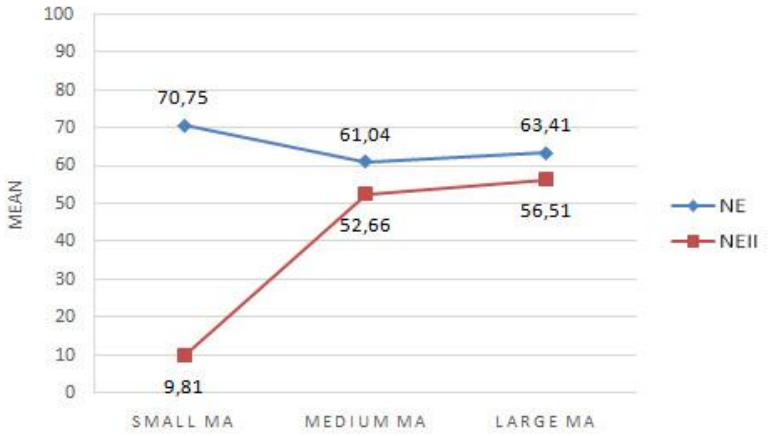


Figure 1. Comparison of the Average Results of NE and NEII across Different Groups of Private MAs

Institutionally, a score is considered as the reflection of an institution's success, so it is not uncommon that the NE score become the main target. When NE results are bad, students will be embarrassed. The teachers also feel ashamed if many of their students get bad scores. The prestige of the institution will be at risk if many students get low scores in NE. The most feared impact is that the institution will have low enrollment in the next academic year because the society considers the

institution as non-qualified [18]. Such condition influences the sustainability of an MA because the number of students becomes the determinant of the institution's sustainability.

In addition to the reasons above, some small MAs are also less confident in facing the NE due to their inability to provide good learning quality. This is reflected in a statement like this: "Our institution will not be able to get the NE results we are targeting without cheating." This expression indicates the embarrassment of the MA when their students get a less satisfactory NE scores. This makes them leave their conscience that they take whatever ways that can make them achieve good results in NE.

Based on the origin of the region, the small MAs' position as mentioned above is mostly contributed by the MAs in Madura and Tapal Kuda region. Tapal Kuda region is an area in East Java inhabited predominantly by the Madurese, with the area covering Pasuruan (the eastern part), Probolinggo, Lumajang, Jember, Situbondo, Bondowoso, and Banyuwangi. Inhabited by Javanese minorities, the influence of the Madurese culture in the region is so strong that Madurese becomes the cultural character of the region. The "Other" region refers to areas in East Java other than Madura (Bangkalan, Sampang, Pamekasan and Sumenep) and Tapal Kuda. Why is there a big distortion between the results of the NE and NEII in the region? Figure 2 presents the average position of the NE with NEII in three areas: Madura, Tapal Kuda and Others.

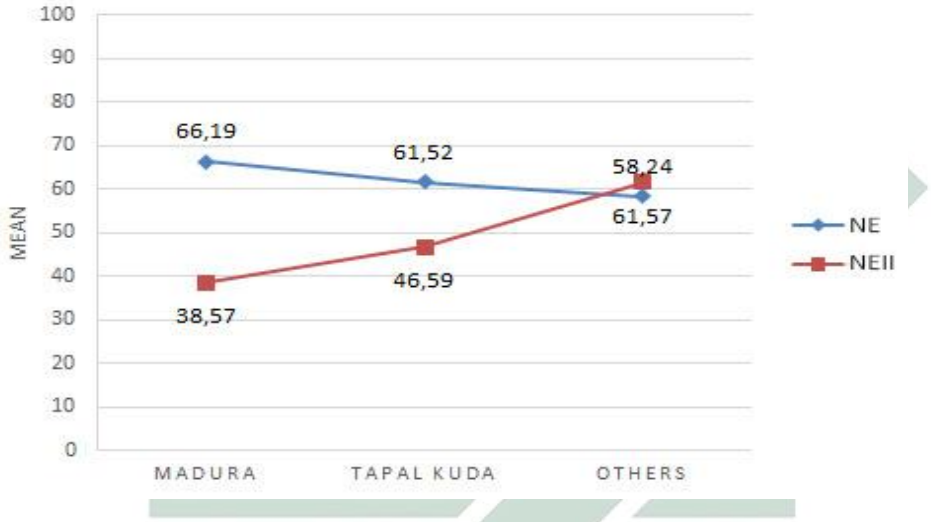


Figure 2. Comparison of the Average Results of NE and NEII of Private MAs Based on the Regions

There are several hypotheses that can be formulated in relation to the above phenomenon. Firstly, most of the MAs in the region are managed by or affiliated to pesantrens with over 60% of religious lessons in the curriculum; the rest are general lessons. Such load of learning can go beyond the capacity and ability of the students. Moreover, in the evenings the students are still required to study the Quran at pesantren. This can bring a negative effect on students' health both physically and psychologically. It is not infrequently that the students become sick and psychologically anxious when the days of the NE are getting closer. They are also concerned if the cannot pss the NE. This results in the lack of self confidence which in turn lead them to find a shortcut to get the intended scores for the NE [19].

Second, the characteristic of the Madurese is that they uphold their dignity and self-respect. They will take whatever risk to keep these two essentials [20]. In relation to the NE, the results of the NE are often regarded by teachers and MA managers in these two areas as betting on the prestige and self-esteem of the institution. Therefore, they will do anything as long as the purpose of obtaining good NE results is achieved, regardless whether the ways they take violates the provisions of Islamic teaching or not.

Based on the previous two arguments, students' mathematics achievement in the NE mathematics lesson from private MAs is actually far adrift from those of public MAs. The difference is not only 1 to 2 points but can be ranging from 5 to 20 points. The pseudo achievement examined both in terms of the MA size (small, medium, and large) and the territorial aspect (Madura, Tapal Kuda, or Other) in corroboration support the above argument.

4. Conclusions

The mathematics achievement of students for the NE 2016 does not differ much between those from the from private and public MAs in East Java. Although the average result of public MA students is higher than the private MA students, the difference is not significant (either from MIPA or IPS study stream). However, the mathematic achievement of private MA students which is equally comparable to the achievement of the students from public MAs is obtained through fraud. Therefore, their scores can be considered as pseudo achievement.

Other findings from this study show that the practice of dishonesty in taking the examination commonly happen in small MAs in Madura and Tapal Kuda region. Observably, MAs in this group have relatively poor resources or have students with low academic ability. Therefore, the Ministry of Religion needs to explicitly eliminate or at least reduce the incentives related to the value of the NE in madrasahs with low integrity, and to give reward to the madrasahs who have the strong intention to reduce fraudulent practices. The possible policy for the madrasahs with high integrity is by taking the NEII scores as one of the consideration in student admission to Islamic State Islamic University. Students from madrasahs with high NEII get the priority, while students from madrasahs with low NEII are given penalty or low priority.

References

[1] Ali, M & Furqon 2016 Madrasah Students' Achievement: Study in Indonesia *Global and Stochastic Analysis, 3*(3), 181-190
[2] Rahim, H 2004 Anatomi Madrasah di Indonesia *Edukasi: Jurnal Penelitian Pendidikan Agama dan Keagamaan, 2*(2), 23-35
[3] Ahid, N 2010 Problem Pengelolaan Madrasah Aliyah dan Solusinya *Islamica: Jurnal Studi Keislaman, 4*(2), 336-353
[4] Ali, M, Kos, J, Lietz, P, Nugroho, D, Furqon, Zainul, A & Emilia, E 2011 *Quality of Education in madrasah: Main study* Jakarta: Ministry of Religious Affair
[5] MORA (Ministry of Religious Affair) 2015 *Profile of Madrasah in Indonesia* Jakarta: Madrasah Education Directorate
[6] Kemenag RI 2016 *Data lembaga RA/Madrasah* Retrieved 24/07/2017, from https://emispendis kemenaggoid/ madrasah1516/
[7] Asadullah, MN & Chaudhury, N 2016 To madrasahs or not to madrasahs: The question and correlates of enrolment in Islamic schools in Bangladesh *International Journal of Educational Development,* 49, 55-69
[8] Rao, N & Hossain, MI 2011 Confronting poverty and educational inequalities: Madrasas as strategy for contesting dominant literacy in rural Bangladesh *International Journal of Educational Development, 31,* 623-633
[9] Lintner, B 2003 *Religious Extremism and Nationalism in Bangladesh* New Delhi: The Institute of Conflict Management, Faultlines
[10] Tan, C & Kasmuri, A 2007 Islamic religious education: Case study of a madrasah in Singapore In Tan, C & Chong, KC (Eds), *Critical Perspectives on Values Education in Asia* (pp 109-124) Singapore: Prentice Hall
[11] Lukens-Bull, R 2010 Madrasa by Any Other Name: Pondok, Pesantren, and Islamic Schools in Indonesia and Larger Southeast Asian Region *Journal of Indonesian Islam*, *4*(1), 1-21

[12] Nizah, N 2016 Dinamika Madrasah Diniyah: Suatu Tinjauan Historis *Edukasia: Jurnal Penelitian Pendidikan Islam*, *11*(1), 181-202
[13] Al-Hasani, SMA, Ismail, AR, Kazeemkayode, B & Elega, DAQ 2017 Creating a Practicing Muslim: A Study of Qawmi Madrasah in Bangladesh *British Journal of Education, Society & Behavioural Science, 20*(3), 1-9
[14] Andrabi, T, Das, J, Khwaja, A & Zajonc, T 2005 *Religious school enrolment in Pakistan: A look at the Data* World Bank Working Paper Series no3521
[15] Supa'at 2011 Tranformasi madrasah dalam sistem pendidikan nasional *Jurnal Penelitian dan Evaluasi Pendidikan, 15*(1), 155-186
[16] Newhouse, D & Beegle, K 2005 *The effect of school type on academic student achievement: Evident from Indonesia* World Bank Policy Research Working Paper 3604
[17] Asadullah, MN, Chaudhury, N & Dar, A 2006 *Student achievement condition upon schooll selection: Religious and secular secondary school quality in Bangladesh* World Bank Working Paper Number 140
[18] Kusaeri, K 2016 Studi Perilaku Cheating Siswa Madrasah dan Sekolah Islam Ketika Ujian Nasional *Edukasia: Jurnal Penelitian Pendidikan Islam, 11*(2), 331-354
[19] Hartanto, D 2012 *Menyontek: Mengungkap akar masalah dan solusinya* Jakarta: Indeks
[20] Rochana, T 2012 Orang Madura: Suatu tinjauan antropologis *Humanis, 11*(1), 46-51