# CONFERENCE PROCEEDINGS

## INTERNATIONAL CONFERENCE ON MATHEMATICS AND SCIENCE EDUCATION (ICoMSE) 2019

Malang, 27-28 August 2019

ISBN: 978-602-73915-7-4

***Strengthening Mathematics and Science Education Research for The Challenge of Global Society***

Editors:
Prof. Dr. Hadi Suwono, M.Si
Habiddin, Ph.D
Dr. Sumari, M.Si
Dr.Sc. Anugrah Ricky Wijaya, M.Sc

Faculty of Mathematics and Natural Sciences
Universitas Negeri Malang, Indonesia

ICoMSE

Conference Proceedings

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# International Conference on Mathematics And Science Education (ICoMSE) 2019

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# Welcoming Speech

Assalamu'alaikum warahmatullahi wabarakaatuh

*Dear distinguished keynote speakers, invited speakers, the excellent participants, members of the committee, ladies and gentlemen.*

On behalf of the organizing committee, I thank you for your participation in the Third International Conference on Mathematics and Science Education (ICoMSE) held on August 27th–28th, 2019 in Malang. This conference is also presented to commemorate the 65th anniversary and the 13th lustrum of Universitas Negeri Malang.

Please allow me to take this opportunity to give my sincere appreciation and gratitude to the excellencies keynote speakers including Dr. Kim Chwee Daniel Tan from Nanyang Technological University, Singapore; Dr. Saeed Almuntasheri from Albaha University, The Kingdom of Saudi Arabia; Prof. Peter Grootenboer from Griffith University, Australia; Prof. Lilia Halim from Universiti Kebangsaan Malaysia; Prof. Dr. Hadi Suwono, M.Si from Universitas Negeri Malang and Dr. Noor Azean and Marlina Ali From University Teknologi Malaysia. I would also like to express my gratitude to all of the participants who have contributed to this conference.

*Ladies and gentlemen*

This annual conference also serves to further the advancement and innovation in teaching and learning in the area. I do believe that the two days meetings and discussions have facilitated a platform as an opportunity for researchers to meet academics and practitioners from different parts of the world and to enlarge their networks with a person to person contacts in a high-quality academic convention.

I'd like to take the opportunity to say a big thank you to all the committee members that have worked hard to make this conference a success. A conference is only as good as the people that attend and the standard of the work that is presented, and I would like to thank you - the participants - for making it so.

Thank you very much, Assalamu'alaikum warahmatullahi wabarakaatuh

Malang, August 2019

**Prof. Dr. Hadi Suwono, M.Si**
Dean of FMIPA UM

# Preface

To celebrate the 65th commemoration of Universitas Negeri Malang and the 13th lustrum, FMIPA UM has the opportunity to carry out this conference. Five fabulous keynote speakers including Dr. Kim Chwee Daniel Tan from Nanyang Technological University, Singapore; Dr. Saeed Almuntasheri from Albaha University, The Kingdom of Saudi Arabia; Prof. Peter Grootenboer from Griffith University, Australia; Prof. Lilia Halim from Universiti Kebangsaan Malaysia, Malaysia; Prof. Dr. Hadi Suwono, M.Si from Mathematics And Natural Sciences Faculty, Universitas Negeri Malang, Indonesia and over 300 participants with 313 orally presented articles joined to this conference.

The future contemporary and global society raises a massive challenge to all parties, including the mathematics and science education community, to have a significant impact on society. Therefore, the conference theme "strengthening mathematics and science education research for the challenge of global society" points out the need for continuous reconsideration of the links between mathematics and science education research and the contemporary professional, social and scientific challenges.

There is often a gap between mathematics and science education and research in mathematics and science. We need to improve and inspire mathematics and science education by taking into account research data in the relevant field. The development of mathematics and science education research should be grounded by the mathematics and science research results. Mathematics and science education research also brings those results to be more functional, well disseminated and well informed to the broader community. Therefore, although mathematics and science education research is the core of this conference, several mathematics and science papers are also welcomed.

The results of research in mathematics and science education should be adapted to the needs of mathematics and science educators and should be transferred and disseminated effectively to the teaching community in order to empower the development of mathematics and science knowledge and its contribution to the better civilization. Finally, I do hope that this proceeding may contribute to disseminating research results in the relevant area.

Malang, August 2019

**Habiddin, PhD**
Chairman

## CONTENTS

**Committee** ..... **2**
**Welcoming Speech** ..... **3**
**Preface** ..... **4**
**The Relevance of Metacognition Strategies towards the Achievement of Biology Learning Outcomes of High School Students (Widianingsih)** ..... **10**
Introduction ..... 10
Research method ..... 12
Results and Discussion ..... 14
Conclusions ..... 19
Acknowledgments ..... 19
References ..... 20
**Needs analysis of development genetics flash flipbook multimedia based on improve learning models in Ikip Budi Utomo Malang (Mistianah & Khoirunnisa)** ..... **22**
Introduction ..... 22
Methods ..... 24
Results and Discussion ..... 24
Conclusion ..... 26
Acknowledgements ..... 26
References ..... 26
**Students' difficulties in completing geometry tasks based on spatial ability (Wulandari, Sa'dijah, As'ari, & Sulandra)** ..... **28**
Introduction ..... 28
Method ..... 30
Result and Discussion ..... 32
Discussion ..... 35
Summary ..... 36
References ..... 36
**Developing ethnomathematics-based mathematics learning module on quadrilateral material for class 8 junior high school students (Sari & Qohar)** ..... **38**
Introduction ..... 38
Method ..... 40
Results ..... 42
Discussion ..... 46
Conclusion ..... 48
References ..... 48
**Innovation of an integrated timer learning media to support inquiry-based physical learning in kinematics competence for senior high school (Supriana, Parno, Suyudi, & Bunyamin)** ..... **50**
Introduction ..... 50
Method ..... 51
Results ..... 53
Discussion ..... 55
Conclusions ..... 56
Acknowledgements ..... 56
References ..... 56

**Android-based mobile learning media: strategies to improve botanical literacy skills (Sari, Hassan, Sunarmi, Sulasmi, Tenzer, Mujahidin, Widowati, & Wicaksono) ..... 58**
Introduction ..... 58
Method ..... 60
Results and Discussion ..... 61
Conclusion ..... 63
Acknowledgment ..... 63
References ..... 63
**Higher order thinking process of junior high school students with linguistic intelligence, logical-mathematical intelligence, and visual-spatial intelligence in solving mathematical problems (Pamilu & Lestyanto) ..... 65**
Introduction ..... 65
Method ..... 67
Research Result ..... 68
Conclusions and Suggestions ..... 76
References ..... 77
**Development of Module for Remedial Learning at High School on Biology Subject (Prasetyo, Handayani, Sulisetijono, Faradina, Kurniasih, & Suryanitha) ..... 79**
Introduction ..... 79
Development Method ..... 82
Conclusion ..... 86
References ..... 86
**The Influence of Inquiry Learning Integrated Nature of Science Toward Critical and Creative Thinking Skills (Masruroh, Ibrohim, & susilo) ..... 88**
Introduction ..... 88
Method ..... 90
Result and Discussion ..... 91
Influence of Inquiry Based Learning Integrated NOS on Critical Thinking Skills ..... 93
Influence of Inquiry Based Learning Integrated NOS on Creative Thinking Skills ..... 94
Conclusion ..... 95
References ..... 95
**The Effect of Android-Based Interactive Multimedia in Respiratory System Materials to Improve Science Literacy Skills of Class XI Students in SMAN 02 Batu (Dewi, Susilo, Tenzer, & Sudrajat) ..... 100**
Introduction ..... 100
Method ..... 101
Results ..... 102
Discussion ..... 104
Conclusion ..... 109
References ..... 109
**Variance, Number and Distribution of Cognitive Levels Class 10 Biology Subjects in Curriculum 2013 (Prasetyo) ..... 112**
Introduction ..... 112
Content Standards, Basic Competencies, Competency Indicators and Item Indicators ..... 112
The ability to think critically ..... 116
Creative thinking ability ..... 116
Research Method ..... 117

Research Result ..... 117
Conclusion ..... 118
Discussion ..... 118
References ..... 119
**Development of Problem-based Learning Module Based on the Allium sativum's Potency in Hyperlipidemic Mice to Improve Student's Critical Thinking Skills and Cognitive Learning Outcomes (Regia, Lestari, & Indriwati) ..... 120**
Introduction ..... 120
Materials and Methods ..... 122
Research subject ..... 122
Research procedure ..... 122
Result ..... 123
Analyze ..... 123
Design ..... 124
Develop ..... 124
Implement ..... 127
Evaluate ..... 127
Discussion ..... 128
Summary ..... 130
References ..... 130
**The Development of Problem Solving Module Based on Research at the Level of Advanced Glycation End Products (AGEs) of Hyperlipidemic Mice Model to Improve Student Critical Thinking Skills (Lubis, Lestari, & Indriwati) ..... 133**
Introduction ..... 133
Materials and Methods ..... 135
Research Design and Sample ..... 135
Results ..... 136
Discussion ..... 137
Summary ..... 138
Acknowledgments ..... 138
References ..... 138
**The Analysis of Student's Mathematical Representation Errors in Solving Mathematical Problem-Solving Problems and Giving Scaffolding (Apriyanto, Chandra, & Permadi) ..... 140**
Introduction ..... 140
Methods ..... 142
Results ..... 143
S1 Student's Work, Representation Errors in Solving Problem-Solving Problems, and Scaffolding Given. ..... 143
S2 Student's Work, Representation Errors in Solving Problem-Solving Problems, and Scaffolding Given. ..... 145
S3 Student's Work, Representation Errors in Solving Problem-Solving Problems, and Scaffolding Given. ..... 146
Discussion ..... 148
Visual Representation Errors and Scaffolding ..... 148
Verbal Representation Errors and Scaffolding ..... 149
Symbolic Representation Errors and Scaffolding ..... 149
Conclusions ..... 150
References ..... 150

**Determining Promotion Route of Indraprasta University using Greedy Algorithm (Bachtiar, Lestar, & Parwati) ..... 152**
Introduction ..... 152
Methods ..... 153
Greedy Algorithm ..... 153
Unified Modeling Language ..... 153
Related Work ..... 153
Result and Discussion ..... 154
System Design ..... 156
Conclusions ..... 156
References ..... 156
**Development of Kampung Organik Model Pasca Pilot Project of Zero Waste Zone to Supporting Public Economy and Government Programs of Food Reserved Garden (Muhdhar, Susilowati, &Budiasih) ..... 158**
Introduction ..... 158
Methods ..... 159
Results and Discussion ..... 163
First Year (2015): Development of Media and Instructional Materials Supporting Development of Kampung organic model ..... 163
Second Year (2016): Applying Model of Kampung Organik is Supported by Media and Instructional Materials in Malang ..... 165
Third Year (on Process): Disseminating of Kampung organik is Supported by Media and Instructional Materials ..... 170
Conclusion and Suggestion ..... 173
References ..... 174
**The Development Of Integrated Hooke's Law of Learning Media for Concept Attainment And Skill Problem-solving in Competency Analysis of Material Elasticity (Supriana, Shodiqin, & Pratiwi) ..... 177**
Introduction ..... 177
Method ..... 178
Results and Discussion ..... 178
Media Validity ..... 179
Practicality of Media ..... 179
The Effectiveness of Appropriate Media Prototypes Designed in Learning ..... 180
Conclusion ..... 182
References ..... 183
**Collegiality as a Key for Improving Students Success in Lesson Study Practices (Istikomayanti, Lathifah, & Mitasari) ..... 184**
Introduction ..... 184
Method ..... 186
Discussion ..... 191
Practices of the Success of Lesson Study in Improving Student Learning ..... 192
Teachers Collaboration's Practicess ..... 193
Conclusion ..... 195
References ..... 195
**Identification of Concepts for Class X Students about Viral and Bacteria Topics in Malang and Lamongan (Zulfia, & Susilo) ..... 198**
Introduction ..... 198
Research Method ..... 199

Results ..... 200
Discussion ..... 201
Conclusion ..... 202
Suggestion ..... 203
References ..... 203
**Need Analysis of Biology Teaching Material using Macrozoobenthic Diversity as Bioindicator Water Quality of Metro River Module for Junior High School (Damayanti, & Sueb) ..... 205**
Introduction ..... 205
Experimental Details ..... 206
Result and Discussion ..... 206
Conclusions ..... 211
Acknowledgments ..... 211
References ..... 211
**The Effectiveness Of Cooperative Learning Model Type Jigsaw And STAD Based HOTS On Mathematical Problem Solving Abilities (Anggoro & Riyani) ..... 215**
Introduction ..... 215
Theoretical BASIS ..... 217
Research Methods ..... 218
Results and Discussion ..... 219
Early Students' Abilities on Mathematical Problem Solving (Pretest) ..... 219
Final Ability to Solve Students' Math Problems (Posstest) ..... 220
The Effectiveness of Cooperative Learning Type Jigsaw and STAD based-HOTS on Mathematical Problem Solving Capabilities ..... 222
Conclusion ..... 223
References ..... 224
**Games-Educative Space on Development of Flipbook Teaching Materials Based Inquiry Lesson (Suyudi, Sulur, & Betari) ..... 225**
Introduction ..... 225
Methods ..... 227
Results ..... 228
Conclusion ..... 230
References ..... 230
**The Epistemic Game of Students during Physics Learning by Integral Learning (Puspitasari) ..... 232**
Introduction ..... 232
Methods ..... 234
Results ..... 235
Discussion ..... 236
Summary ..... 237
Acknowledgments ..... 238
References ..... 238

# Collegiality as a Key for Improving Students Success in Lesson Study Practices

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**Abstract.** Collegiality plays an important role in the profession of educators, especially teachers. Some schools have not yet try to maintain the quality of learning and even improve their learning at school with responsibilities among peers. This study illustrates the development of collegiality among teachers, especially improvisation and increasing teacher confidence. Some schools in Malang City, East Java, Indonesia have implemented Lesson study to improve the quality of their colleagues, improvise in learning. This qualitative research illustrates the development of collegiality between teachers, improvisation and teacher self-confidence, especially in learning. Data from fourteen teachers and principals were collected using questionnaires, interviews and observations of classroom learning. The results of this study, that some schools fail to implement Lesson Study continuously because collegiality beliefs and practices still low. But on the other hand there are schools that have successfully applied collegiality in increasing student learning. Only a few studies focus on aspects of the responsibilities of colleagues in developing teacher professionalism. Most studies still focus on pedagogical competencies as teaching skills while still ignoring the role of the learning community. Thus, developing the quality of collegial learning in schools is very important to support a shared learning atmosphere

## Introduction

Indonesian government awards teacher professionalism with teacher certification to improve teacher professional competence. Strengthening the quality of teacher professionalism will be important as a focus of state development. According to Fahmi et al., Al. (2011) in 2006, Indonesia began implementing a national teacher certification program with the aim of certifying 2.3 million teachers in 2015 with a budget of US $ 460 million. This large cost shows that there is no quantitative study to evaluate the impact of the program on student achievement. The assessment of teacher professionalism includes work ethic, discipline, the ability to accept criticism and advice, the ability to communicate, and the ability to cooperate.

Basically, the process of collaboration to improve the quality of professionalism of teachers has not been specifically regulated in Indonesian. Through a number of programs and development activities, Lesson Study was chosen by the city government of Malang as an effort

to develop collaboration between teachers to achieve an increase in the quality of learning. The efforts to develop the teacher profession that are commonly carried out by public and private schools are through the TeacherWorking Group or Kelompok Kerja Guru (KKG), Teacher's Forum Field of Study or Musyawarah Guru Mata Pelajaran (MGMP) and so on. These activity was initially according to Goverment Regulation No.38 in 1994. It has object to encourage teachers to improve their knowledge and skills in planning, implementing, and evaluating teaching learning activities. Teachers also share problems in daily teaching practice and solve the problems according to the characteristics of subjects, it also provide teachers with the opportunity to share information and experiences tobuild collaboration with other institutions to create conducive, effective, and joyful learning.

This research seeks to describe the role of the teacher community in improving teacher professionalism through its best practices, known as collegiality. Through Lesson Study activities several schools in Indonesia have succeeded in increasing teacher collaboration in improving the quality of learning. However, with the increasingly tight schedule of teaching activities, the completeness of teaching administration, or school agenda schedules full the workload of teachers. It makes collaboration activities between teachers are difficult to be established. This also happened in several schools abroad from the results of the research report. 1,2,4,5.

Lesson study developed currently in Indonesia is named LSLC (Lesson Study for Learning Community). LSLC is a collaborative activity of Lesson Study activists from education practitioners, teachers, lecturers, and school leaders and related institutions who collaborate on improving learning. In the collaborative process, there are similar needs between higher education institutions and schools. According to Nurwidodo et., al., (2018) through collaborative activities of schools and colleges, both face the same opponents the problem of quality of learning. The problem of the quality of learning in Indonesia according to Nurwidodo et., al., (2018) is a matter of culture to develop a network and dependency between teachers, also with higher education institutions, and the community. The results of the application of MGMP and KKG in several schools in West Java according to data from Supriatna (2004) have not been significant. The majority of MGMP activities are mostly in big cities or sub-districts, whereas in rural areas there are very few MGMP activities which are quite intensive. This is still in line with Nurwidodo that in forming a network of cooperation between teachers, schools and education practitioners hold similar importance.

The results of this preliminary observation indicate that some schools have succeeded in increasing collegiality through collaboration in Lesson Study, but there are some schools that have not succeeded. This failure is due to the dependence between teachers to collaborate yet to be seen, and there is no habit of nurture collaborative activities in their schools.

The main focus of this research is to see how the collaboration that occurs in schools with teachers or several teams of teachers who carry out Lesson Study in an effort to develop learning and professionalism. Some schools have succeeded in increasing collegiality through collaboration in lesson study, but there are some schools that have done lesson study but the practices in lesson study have not become a habit of collaborative activities in their schools. The main focus of this research is to see how the collaboration that occurs in a school with a teacher or several teams of teachers who carry out Lesson Study as an effort to develop learning and professionalism.

## Method

This study uses descriptive quantitative and qualitative data research and involves five schools as subjects. The schools are (one private elementary school) Saleh Children's Elementary School, two public elementary schools (SDN Kauman 1, SDN Purwodadi 1), one private SMP (MTs Muhammadiyah 1), one UM private high school laboratory) in Malang City. Data obtained from fourteen people consisted of teachers and school leaders from the elementary school, junior high school and senior high school level. This descriptive study consisted of quantitative data from questionnaires and qualitative data from observation and interview data. Data collection uses purposive sampling method, which is determined by schools that have conducted Lesson Study activities. The questionnaire instrument used answer choices on a scale of measurement from 1-7, selected responses from 1 (one) (strongly disagree) to 7 (seven) (strongly agree), which was questions item adapted from Shah (2011).

The results of the questionnaire were confirmed by direct interviews with research subjects. The collegial aspects identified are aspects of trust and support among peers, how observation learning activities, learning planning and evaluation of student learning activities, discussion of ideas and skills, peer learning, sharing of resources, and curriculum development. The response options range from 1 (strongly disagree) to 7 (Strongly agree), showing how true each statement is about it. Next, to see how teachers' practices in developing collegiality are explored through direct interviews. The interview guide instrument was used to identify collegiality activities by direct interviews with teachers and principals. The results of the interview are written on the interview sheet without editing and improving the data and used as supporting data.results

The limitation of this research is the limited number of respondents so that further studies are needed on the greater number of respondents. Tables 1.1 through Table 1.7 contain the results of a survey of teachers with several collegiality factors measured that is demonstrating mutual support and trust, observing one another teaching, sharing ideas and

expertise, teaching each other, developing curriculum together, and sharing resources. In the high score obtained the aspect of teacher collegiality is very good, while the medium and low scores indicate the aspect of teacher collegiality is still low. Data obtained on the collegiality aspect of teachers in Malang, East Java is still very low on the desire to hide the mistakes of students (Table 1.1), feel free to share student problems with other teachers (Table 1.4), and are still hesitant to ask other teachers for help provide input on learning instructions. While the medium result is that the teacher has not sufficiently appreciated the professionalism of other teacher's colleagues (Table 1.1), the teacher is still not comfortable being observed by other colleagues (Table 1.2), and still does not want to argue collectively about learning (Tables 1.3 and 1.4).

Table 1.1 Colegiality Aspect Questionnaire Results

| | **Factors of collegiality**<br><br>**Demonstrating mutual support and trust** | **Average score** | **Description** |
|---|---|---|---|
| 1 | Teachers provide strong social support for colleagues. | 6,63 | High |
| 2 | Professional interactions among teachers are cooperative and supportive. | 6,75 | High |
| 3 | There is a feeling of trust and confidence among staff members | 6,38 | High |
| 4 | I can count on most of my colleagues to help me out anywhere, anytime even though it may not be part of their official assignment. | 5,25 | High |
| 5* | Teachers in this school hide their failures and mistakes | 2,88 | Low |
| 6 | Teachers consider their colleagues as their friends. | 5,75 | High |
| 7* | Teachers in this school do not respect the professional competence of their colleagues. | 4,38 | Medium |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Table 1.2 Colegiality Aspect Questionnaire Results

| | **Factors of collegiality**<br>**Observing one another teaching** | **Average Scores** | **Description** |
|---|---|---|---|
| 8 | We invite other teachers to observe our teaching. | 5,00 | Medium |
| 9* | Teachers in this school mind being observed by their colleagues while teaching | 4,50 | Medium |
| 10 | We regularly observe one another teaching as a part of sharing and improving instructional strategies. | 5,63 | High |
| 11 | Most of the teachers in this school are receptive to the presence of other professionals in their classrooms. | 5,63 | High |
| 12 | I believe it to be beneficial for my teaching to be open with colleagues about my successes and challenges. | 6,71 | High |
| 13 | Feedback received by the colleagues is considered and responded to appropriately | 6,00 | High |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Table 1.3 Colegiality Aspect Questionnaire Results

| | Factors of collegiality<br>Observing one another teaching | Average Scores | Description |
|---|---|---|---|
| 14 | Cooperation and collaboration exists across departments. | 6,00 | High |
| 15 | We jointly plan and prepare teaching strategies and procedures. | 5,75 | High |
| 16 | Majority of the teachers participate actively in meetings. | 5,00 | High |
| 17 | We make collective agreements to test an idea or new approach in teaching. | 4,75 | Medium |
| 18 | We jointly accredit new programs and practices. | 5,75 | Medium |
| 19 | My colleagues and I collectively analyze our teaching practice. | 5,00 | Medium |
| 20* | Teachers do not praise or criticize each others teaching. | 3,63 | Medium |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Table 1.4 Colegiality Aspect Questionnaire Results

| | Factors of collegiality<br>Sharing ideas and expertise | Average Scores | Description |
|---|---|---|---|
| 21 | We often argue over educational theories, philosophies, or approaches. | 4,88 | Medium |
| 22 | Teachers encourage each other to contribute ideas and suggestions. | 6,75 | High |
| 23 | We often ask each other about classroom management ideas and suggestions. | 6,38 | High |
| 24 | Teachers in this school do not feel comfortable about discussing their students' problems. | 2,00 | Low |
| 25 | Teachers in this school often ask for suggestions to specific discipline problems. | 5,63 | High |
| 26 | We discuss frequently about school improvement strategies. | 5,50 | High |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Tabel 1.5 Colegiality Aspect Questionnaire Results

| | Factors of collegiality<br>Teaching each other | Average Scores | Description |
|---|---|---|---|
| 27 | We often teach each other informally. | 5,88 | High |
| 28 | Teachers in this school enjoy teaching in teams. | 5,88 | High |
| 29 | We feel part of a learning community which values shared responsibility for ongoing learning. | 5,88 | High |
| 30 | Teachers give demonstrations on how to use new models or strategies | 5,63 | High |
| 31 | Teachers in this school like to share what they have learned or want to learn | 6,25 | High |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Tabel 1.6 Colegiality Aspect Questionnaire Results

| | Factors of collegiality<br>Developing curriculum together | Averages scores | Description |
|---|---|---|---|
| 32 | Most teachers in this school contribute actively to making decisions about curriculum | 5,25 | High |
| 33 | I find time to work with my colleagues on curriculum during a regular work day | 5,13 | High |
| 34 | Teachers in this school jointly prepare their lesson plans. | 5,13 | High |
| 35* | Teachers in this school feel hesitant in asking for help on specific instructional problems. | 3,00 | Low |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Tabel 1.7 Colegiality Aspect Questionnaire Results

| | Factors of collegiality<br>Sharing resources | Averages scores | Description |
|---|---|---|---|
| 36 | My colleagues and I share materials related to my subject teaching. | 5,88 | High |
| 37 | Teachers in this school often lend and borrow materials like worksheet and lesson plans. | 5,38 | High |
| 38 | We often share journal articles and educational books. | 4,63 | Medium |

Note: scores 1.00-3.00 (low category); 3.01-5.00 (medium category); 5.01-7.00 (high)), (*) negative response

Some of the schools we observed were still doing Lesson study as a teacher collaboration activity, but most of the school teachers were doing lesson studies with communities outside the school or known as the lesson study club. These results indicate that the Lesson Study was successfully implemented in small schools in Malang. However, some schools that have conducted study studies have not contributed to the collegiality of teachers. This is like the results of our interview as follows:

Statement by school leader A about applying Lesson Study in his school: " Lesson study is very good for the development of the learning process, more students learn with the challenges given by the teacher. This is a new thing that did not exist before. However, only 1-2 teachers currently still open their classes for several periods. "

Opinion leaders A school on the development of lesson study in school: " The stages of lesson study are plan, do, and see very well to construct students' thinking skills. That is the most recent where teachers are avoided to provide knowledge or information directly. At first we felt impatient seeing students who did not know the answers , and the teacher did not just give an answer. But finally we understand that the process of finding knowledge by students themselves is also important, so learning becomes more meaningful for students. "

Opinion school leaders A of the problems of implementation of Lesson Study in school : " Lesson studies are currently conducted by 1-2 teachers only, so it is not a lesson study if only 1-2 teachers open classes. But there are lesson study communities from other schools or other practitioners who come during plan, do and see activities. ... we could not do lesson study because of time constraints, the schedule of the teachers who certainly could not have to come to the stage of the plan, then observation on the do, and reflection "

The data for the implementation of lesson studies conducted by schools ranges from only 3-5 times a year. This is a small amount to give significant effect to increase teacher collegiality. Thus, imply with the low openness of the teacher to the learning undertaken as a desire to be peer observed (Table 1.2), together collectively commenting on learning (Table 1.3) only occurs a few times. The results of the study report (Akiba, 2018) the period time for the implementation of Lesson studies from a minimum of 118 days and about 2 hours to 23 hours will influences teacher collegiality or teacher learning outcomes.

In table 1.1 the elaboration of teacher collegiality factors in the aspects of mutual support and trust with a high category is peer support, cooperative interaction, collaboration trust with colleagues. This shows that teachers in Indonesia have the basic capital to collaborate, the existence of trust with peers, support for friends and the desire to collaborate. But in the aspect of the failure of the learning process to be very covered and feared by the teachers. Though failure is one of the stages of achieving learning success. Some lesson study practices that are continuously successful are in the aspect of teacher openness due to the lack of learning they do. 6,7,12. This has not been entrenched in the collaboration of teachers..12, 13, 14.

The most influential thing for the sustainability of lesson study in a school lies in the high collegiality of teachers, especially in the learning process. Research results (Akiba, 2018; Opfer & Pedder, 2011; Akiba, 2017) that teachers really need a conflict of knowledge, dissonance, in order to change their beliefs about teaching and student learning and require a discussion that might might even enforce existing traditional views about teaching and student learning. While this is the opposite of the conditions of teachers in Malang with the low desire of teachers to ask their peers to see class learning (Table 1.6) and the low desire to collectively or together, discuss, argue about teaching instructions and students' thinking processes (Table 1.3). 17,18.

Another factor that still disturbs the collegiality of teachers and needs to be improved is the appreciation of expertise or professionalism. This aspect is related to the increase in the level of professionalism of teachers both structurally and academic aspects which are still reportedly low. 10,11,13 The relationship between teacher disclosure factors which is still low is related to the recognition of teacher professionalism. Fellow teachers have not honored in the form of appreciation, the desire to study with more outstanding peers, as well as exchanging learning innovations and sharing their students' problems as shown in Table 1.4. These results indicate that teachers are also not accustomed to criticizing each other in Table 1.3. In this table, the majority of teachers have shared ideas and expertise factors, with a discussion of learning techniques and methods and being able to share learning resources and classroom management and school management efforts in the Table. 1.5. The basic strength of collaboration is already possessed by most teachers but it has not yet become a form of collegiality in the aspect of improving learning.

In Table 1.2 on the aspect of Observing one another teaching , the results appear to conflict with the discussion of the results of this previous study. Most of the teachers stated that they believed that open class activities would bring benefits to student learning, the teachers also accepted and appreciated the presence of professionals who gave advice to their classes. However, some teachers still object if they have to be observed (medium category). Thus, teachers already understand the

benefits of lesson study activities. However, efforts to develop learning with peers in one school proved to be still limited. The results in table 1.2 are the responses of teachers who have done lesson study with LS technique methods that are already good, but in interpreting the efforts to develop pedagogic and professionalism teachers have not become the main focus of collegiality.

## Discussion

Previous lesson study results focus on developing assistance strategies, while in developing countries have fared without developing assistance. This condition is what goes on with the subject of this study. Forming community needed resources such as institutions and utilizing partnerships with schools. The results of Nurwidodo's analysis in creating a Lesson Study community require network management according to mutual needs and mutual benefits. Maeda and Yumiko (2018) in their research on the diffusion process of learning studies in developing countries, Indonesia, present the supporting points of the Lesson Study community in Indonesia. However, the results of previous lesson study studies (Kligyte, 2019; Cajkler et. aAl., 2014; Akiba et. al., 2017) focused on strategies for developing aid while developing countries have fared without developing assistance. Thus, efforts to form collegiality in a school can be a solution in overcoming compelling difficulties.

Missing point found by Maeda (2018) in Indonesia lacks supprot and facilities (according to the results of observations and interviews of researchers as well) "most schools that have conducted Lesson studies, claiming that the school has LS" but the evidence of its sustainability was very minimal of expectations the big one. This research implies that the sustainability of lesson study shows the success of the community. The collegiality aspects have been owned and routinely developed by the lesson study community at UM Lab High School. The pattern used by these schools is a good model for schools in Indonesia even with relatively low financial support. The application that has been applied by the LS community in Lab High School is to maintain collegiality with peers.

Teachers collegiality as the key to creating positive interdependence between teachers (Kligyte, 2019; Maeda et. al., 2018; Cajkler et. al., 2014; Akiba et. al., 2017) so that they can innovate continuously. However, lesson studies that entered Indonesia in the early 1990s according to Nurwidodo's research results (2018) suggests the need for strategies in building a community Lesson Study network. Forming such communities required resources and utilized partnerships with schools. Nurwidodo's analysis results in creating a Lesson Study community that required network management in accordance with shared needs, maintaining cooperation and mutual benefits. Maeda and Yumiko (2018) in their research on the diffusion process of Lesson study as an

educational innovation in developing countries, especially Indonesia, conveyed the missing points in forming a lesson study community.

*Practices of the Success of Lesson Study in Improving Student Learning*

Some of the success of the implementation of Lesson Study which is continuously also found in schools in Malang, especially UM Laboratory High School. This school intensively implements lesson study activities in an effort to improve student learning and build collegiality. These practices are the teacher's duty to research their class, the teacher open learning plan based on a schedule and there are adjusments for the study team's schedule. Every week teachers at UM Laboratoium High School who do not teach today are used to collaborative activities to open plans, observe classes, and reflect on classes. Furthermore, the model teacher who opens the class is required to write the results of class researchthrough articles in schools.

This effort has been carried out for a several years until now based on interviews with several teachers at UM Laboratory High School. Following are the statements of several teachers who are the subject of our research

"Lesson studies have been around a few years ago, but they are not very significant compared to the current conditions. Previously we also never got to do LS again. However, the introduction and application of the new LS approach that is focused on strategies to teach all students or constructivists finally we start again. ... At first we were the only two who took the initiative to study LS practitioners. With a few knowledge, we made a presentation and sharing with colleagues at our school. Finally, until now LS activities have become a routine agenda for schools. "

Statements of supporting teacher collaboration strategy through Lesson Study in improving student learning in the classroom.

"We rotate every month what subjects will be open class right. For lesson study teams do not have to be from teachers with the same subjects. We develop more strategies or stages of learning that drive constructivism in students. Sometimes we also discuss material concepts. For open class subjects, there are usually several teachers in the same subject. But for the suggestions and planning of the learning steps all teams are involved. Teachers usually test certain strategies to maximize the potential of soft skills of students who are the main target. For example students who have not been actively collaborating with friends, students who rarely participate in discussions, etc ... "

Our observation was that we participated in LS activities at the UM Laboratory High School. We felt that there was such an atmosphere of collegiality. As an observer outside from school who directly see the planning process, teachers openly accept our presence. He also allowed us to take part in the planning stages of Lesson Study activities. The

collegiality seen from the planning stage when the mediator teacher or the opening speech that can develop the critical thinking of the teachers in his team to plan special learning. The response from the planning team teachers, although not their expertise of study, can also add strategic suggestions as well as identifying the intended class. This discussion went smoothly and argued with each other. The teacher directly know the characters most of students at the school and understand the learning situations that commonly occur in those classes

The success of the lesson study practice to increase collegiality was also seen during the reflection process. The model teacher openly expresses his impressions and reflections on the reflection forum. The model teacher also explained in detail the situations in the learning activities that have been carried out. The other teacher as an observer appreciated the model teacher by giving detailed observations in the form of facts from observations of student learning processes. Comments and suggestions provided no longer revolve around how the teacher manages the class and the physical condition of the class but rather comments on how the students' thinking processes are, whether the teacher's efforts are as expected of students or there are other responses. The results of observations and suggestions become improvements for planning activities in different classes with the same topic / material. Thus the existence of joint reflection efforts is used to innovate further learning.

*Teachers Collaboration's Practicess*

The schools that are the subject of our research also conduct collaborative activities in schools. In particular the practice of collaboration in schools that discuss learning problems in the classroom other than through lesson study , does not exist. This is a characteristic of lesson study which is able to raise student learning problems as an individual who also has the same learning rights. This aspect has not yet become the focus of schools and also stakeholders. However, the practice of collaboration in schools has also been carried out for example in the efforts of curriculum holders in one primary school. School curriculum stewards attempt to synchronize learning outcomes at several different levels from grade 1 to grade 6 in elementary school. Efforts are made through the existence of several field coordinators (Natural Sciences, Social Sciences, Mathematics, etc.) and there are class level coordinators, namely low level class coordinators (Class 1, 2, and 3 Elementary Schools) and top level class coordinators (Grades 4, 5, and 6 elementary).

The practice undertaken is to overcome the achievement gap in each class so that it can guarantee the quality of learning. This collaboration has been carried out and gave good results when compared to the absence of a level coordinator and field coordinator. The task of the level

coordinator and also the field coordinator is to coordinate with class teachers, control the learning achievements of each class level and conduct discussions about changes in the curriculum. With the collaboration between the classroom teacher and the coordinating teacher, it is directly beneficial to the management and quality control of schools. 5,8,9,11,14,15.

The results of interviews with several school leaders who have not successfully carried out lesson study on an ongoing basis stated that they have a main agenda which is of course focused on the vision and mission and excellence of the school. From this statement we conclude that the awareness of improving the quality of schools through both academic and non-academic has been largely carried out and owned by schools in Malang. However, it seems that the approach to the existence of a new method of collaboration, namely Lesson study, still cannot enter into the school program. The schools are now aware of the importance of the uniqueness and uniqueness of the school so that they are not just followers or imitations of practices in other schools. The approach needed by the stakeholders to potential schools certainly requires a separate approach. With the excellence of the school, of course, through the optimization of internal school collaboration, especially in the academic field will provide significant results.

Some academic collaboration practices that have been carried out and standardized by the Education Office such as the Teacher Working Group (KKG) and MGMP (Deliberation of Subject Teachers) have been very well done. However, the school accreditation assessment has not yet reached the assessment of teacher collaboration or has not yet assessed how the school's efforts in improving the professionalism of teachers especially in improving the quality of learning. Thus increasing collegiality of teachers to improve student learning outcomes is very important to be a concern of stakeholders. The best results of the Lesson study practice that is still being done is that the school principal or school stakeholders intensively support the activities of enhancing teacher collaboration to improve their professionalism. 11,12,13,14. The absence of formal support from either the principal or official institution to improve teacher professionalism will cause failure of existing tutoring study practices . 5,8,9,11,14,15.

The lesson study practices that have been understood and practiced by most teachers in Malang are still not comprehensive. Most of them are at the stage of implementing the lesson study stage but have not yet practiced supportive colleagues, especially on learning. The focus of educational research has not yet emerged from the teacher as the main actor in the learning process in his class. So the activity of visiting practitioners or educational experts to improve learning in their classrooms will only be temporary. Thus, awareness is needed in improving the quality of learning that can be pursued through Lesson Study or other collaborative activities owned by the school so that learning does not only belong to the private teacher. The importance of

improving the quality of learning through the professional community as stated in Nurwidodo (20118) is that there are six reasons to improve learning, as an effort to manage continuous professionalism improvement, as an effort for autonomy and discipline, the emergence of awareness from within the teacher to improve the quality of learning and self-discipline, as an effort to improve the learning rights of all students and ensure all students have a learning experience so that they can achieve learning goals, through collaboration with peer teachers so that not only the subject of private class teachers to enhance learning, as an effort to open themselves so as to trigger an increase in the quality of learning, and as an effort to improve learning both visible and measurable and which other expected outcome especially student's character.

## Conclusion

The results show that the practice of improving the quality of learning through Lesson study has been successfully carried out by UM Laboratory High School. However, most schools and teachers have not yet interpreted collegiality in the practice of Lesson study. Furthermore, an approach to class-disclosure is needed to raise awareness and needs of schools in improving the quality of learning, fulfilling students' learning rights, improving the quality of education through the character of collaboration not only by students but also by teachers. These aspects are not owned by schools that fail to implement LS in a sustainable manner. The aspects of openness, mutual argument, mutual conflict of knowledge in the discussion, and not hesitate to convey the problem of student learning.

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