



PROCEEDINGS

BECOMING REFLECTIVE EDUCATORS AND PROFESSIONALS OF LEARNING
November 25–28, 2014

World Association of Lesson Studies
International Conference 2014 in Bandung, Indonesia

WALS



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PREFACE

On behalf of the Organizing Committee of World Association of Lesson Studies (WALS) 2014 International Conference, I would like to welcome all participants both local and overseas to the 8th annual conference at Indonesia University of Education in Bandung, Indonesia. The Bandung conference has attracted attention of international community around the globe. There are 782 registered participants from 29 countries with the largest contingent from Indonesia followed by Singapore, Japan, and Sweden.

The theme of WALS 2014 International Conference is **Becoming Reflective Educators and Professionals of Learning**. This theme reflects the continuity of efforts to be reflective educators and professional who never stop learning. Such is represented in the form knowledge, expertise, and other resources which are developed, invested, accumulated, and distributed to improve the quality of teaching and learning.

In this conference, educators and teachers from Africa, America, Asia, Australia and Europe continents come together to share their research and practices on improving the quality of teaching and learning, teacher education and development, school improvement, and learning community through Lesson and Learning Studies.

This proceeding is a collection of papers presented in the WALS 2014 International Conference. It covers 13 strands:

1. Teacher Professional Development
2. Action Research
3. Pedagogies and Teaching Strategies
4. Designing for Learning with Quality in Specific Subjects
5. Research on Lessons in Different Cultures
6. Issues about Leading Lesson Study
7. Learning Communities for School Reform
8. Developing Communities of Practices
9. Creating Knowledge in Practice
10. Student Learning and Development
11. Lesson and Learning Study in Pre-School
12. Lesson and Learning Study in Special Education settings
13. Lesson and Learning Study in Higher Education

We are sure that the papers and discussions from WALS 2014 International Conference will make a major contribution to the national and international dialogue on Lesson/Learning Studies. However, we would like to remind that the views expressed in the papers are those of each author alone and do not necessarily represent those of the organizing institutions or any of their affiliates.

I wish all of us a fruitful conference and opportunities to build networking during the conference. I hope you enjoy the conference and your time at UPI.

Sumar Hendayana, Ph.D.
Chair
Organizing Committee of WALS
2014
International Conference

Welcome Message

On behalf of the Organizing Committee of World Association of Lesson Studies (WALS) 2014 International Conference, I would like to welcome all participants both local and overseas to the 8th annual conference at Indonesia University of Education in Bandung, Indonesia. This Bandung conference has attracted attention of international community around the globe to join WALS 2014 conference in Bandung . We have 782 registered participants from 29 countries with the largest contingent from Indonesia followed by Singapore, Japan, and Sweden. The theme of WALS conference this year is “Becoming Reflective Educators and Professionals of Learning” as we would like to emphasize the how importance it is for teachers and educators to always reflect and learn from their practices in order to improve their professionalism.

This conference program provides you with information about papers, speakers, and venues. Three hundred eighty-six papers will be shared and discussed during the three-day conference. Four papers will be presented by four recognized keynote speakers from United Kingdom, Japan, United States of America, and Indonesia. Ten papers will be shared on two plenary sessions by invited speakers. Participants have many choices to attend concurrent sessions of 372 papers consisting of symposium, workshop, poster, and paper presentations. In addition, the conference offers participants with optional school visits at all levels of education from pre-school to higher-education on November 28, 2014. During the school visit, participants may observe lessons and participate in a post class discussion.

Collaboration and partnership are the spirit of lesson study. WALS 2014 is made possible through the collaboration and partnership with the Directorate General of Higher Education and West Java Provincial Office of Education.

I wish all of us a fruitful conference and opportunities to build networking during four days of the WALS 2014 International Conference. I hope you enjoy the conference and your time at UPI.



Sumar Hendayana, Ph.D.
Chair
Organizing Committee of WALS 2014
International
Conference

It is with great pleasure that I welcome all of you to the World Association of Lesson Studies (WALS) 2014 annual conference in Bandung, Indonesia. WALS is privileged to work together with Indonesia University of Education in organizing this conference and to receive the support from Ministry of Higher Education, Research and Technology, Republic of Indonesia, West Java Provincial Office of Education, the Government of Bandung City, and Japan International Cooperation Agency (JICA). The Indonesia University of Education has been playing an important role in developing and disseminating Lesson Study across Indonesia as well as to other countries in Asia and Africa through technical cooperation with JICA.

The conference organizing team led by Dr. Sumar Hendayana from Indonesia University of Education has worked extremely hard to ensure the success of our annual conference. As of October 2014, the conference has drawn 819 delegates with the largest contingent from Indonesia (375) followed by Singapore (197), Japan (68), Sweden (48), Phillipines (18), Malaysia (16), Thailand (13), United Kingdom (11), China (8), Hong Kong (8) and Brunei (7). For the first time, African countries such as Ethiopia (7), Zambia (7) and Senegal (2), as well as Bangladesh are represented at a WALS annual conference. This outreach to new countries reflects the influence that Indonesia has in these countries as a result of the partnership they have with JICA and Japanese colleagues working in African countries. A total of 28 countries will be represented at WALS 2014 annual meeting in Bandung.

We look forward to the rich conversations among our delegates during the conference on the theme ***Becoming Reflective Educators and Professionals of Learning***. There are **304 papers, 50 posters, 9 workshops, 9 symposiums, 10 plenary sessions and 4 keynotes**. Our annual conferences bring teachers, academics, researchers and policy makers together to discuss lesson study research and practices and to learn from each other's work. We hope to see the development of professional and academic networks through mutual assistance and information exchange among our members at this meeting.

The success of WALS 2014 Bandung meeting is made possible by the dedication of the local organizing team led by WALS Executive Committee and Council Member, Dr. Sumar Hendayana from Indonesia University of Education. We want to thank them for their hard work over the last 2 years to provide an interesting and stimulating conference programme for all participants. We want to thank the Indonesia University of Education for hosting this conference. We are also thankful for the generous support from Ministry of Research, Technology, and Higher Education, Republic of Indonesia, West Java Provincial Office of Education, the Government of Bandung City and Japan International Cooperation Agency (JICA).

I wish all of you a fruitful and engaging time at WALS 2014.



Associate Professor
President,
World Association of Lesson Studies
National Institute of Education,
Nanyang Technological University, Singapore

On behalf of the West Java Provincial Office of Education, we welcome all the participants from Indonesia and overseas. One of the missions of the West Java Provincial Office of Education is improving the access and quality of education. One of the strategies in improving the quality of education is by implementing Lesson Study as a form of teacher continuing professional development through partnership with UPI that has been established since 2006 to develop and disseminate best practices on lesson study in West Java. Beginning with the piloting of lesson study in Sumedang District, lesson study then spread to 16 districts/cities in West Java. Thousands of teachers in West Java have enjoyed the benefits of Lesson Study for the improvement of the quality of education as activities in lesson study have updated their knowledge and skills in facilitating students' learning.

Activities in teacher professional development through lesson study are conducted at school so that the training for teachers becomes more contextual in solving problems at class levels, it does not require high expenses, and it does not cause teachers to abandon their students while participating in the training. Teachers become confident and accountable in teaching students and teaching-learning activities tend to shift from teacher-centered to student-centered while teacher sensitivity toward students experiencing learning problems has increased. In addition, teachers who have been accustomed to lesson study can adapt easily in implementing the Curriculum 2013 because teacher collaboration in analyzing lessons is not something new in lesson study. Teachers have been accustomed to analyzing lessons to stimulate students to think and reason, and build their knowledge so that students understand phenomenon and not to memorize facts.

At WALS 2014 Conference, West Java Provincial Office of Education has facilitated 200 teachers to participate in this conference and half of them present their papers to share their experiences in lesson study. Through this conference, we hope that teachers in West Java will gain more knowledge to even more optimize classroom teaching and learning. Last but not least, we hope that you enjoy the cool atmosphere of Bandung and the conference.



Prof. Dr. H. Moh. Wahyudin Zarkasyi, CPA
Head of West Java Provincial Office of Education

On behalf of the Directorate of Learning and Student Affairs, Ministry of Higher Education, Research and Technology. We wish you the warmest welcome to all participants from various countries. We have facilitated forty-two LPTKs (Educational Institution for Teacher Training) from Aceh to Papua with grants to develop lesson study to improve the quality of learning in higher education since 2009. We collaborate with teaching and learning experts from UPI (Indonesia University of Education), UNY (State University of Yogyakarta), and UM (State University of Malang) to foster LPTKs in the Western, Central, and Eastern regions of Indonesia. The supports in the forms of block grants for three years have been put to good use by LPTKs to focus on the improvement of teaching and learning quality. In addition, LPTKs partner with neighboring schools to develop school-based lesson study in the third year.

Through lesson study, University lecturers collaborate with teachers to plan, implement lesson plans, and reflect the teaching and learning processes. We witness positive changes from the grant recipients such as lecturers have become more accountable and open to criticism in carrying out teaching and learning activities, and have become more confident in teaching students. There is also a paradigm shift in classroom teaching from teacher-centered to learner-centered, and a more harmonious relationship between LPTKs and schools. Results of the development of lesson study in grant-receiving LPTKs will be shared in WALS 2014 Conference. One of the characteristics of WALS 2014 International Conference is the addition of a new strand called Lesson Study in Higher Education Setting.

We hope that participants of WALS 2014 Conference can learn from each other and build international networks in enhancing the quality of education. Please enjoy your stay in Bandung and we hope you enjoy WALS 2014 Conference.



Dr. Ilah Sailah
Director,
Directorate of Learning and Student Affairs
Ministry of Higher Education, Research and Technology

In this very happy occasion, on behalf of the Indonesia University of Education or Universitas Pendidikan Indonesia (UPI), I would like to welcome all the conference participants, both Indonesian and international participants, to our beautiful UPI campus in the city of Bandung. It is quite an honor for the Indonesia University of Education to host the World Association of Lesson Studies International Conference 2014. This conference is made possible through the cooperation between the Indonesia University of Education (UPI), Bandung City Office of Education, West Java Provincial Office of Education, Directorate of Higher Education, World Association of Lesson Studies (WALS), and Japan International Cooperation Agency (JICA). UPI has been the pioneer of the development of *Lesson Study* since 2006 together with JICA through the SISTTEMS Project (Strengthening In-service Teacher Training of Mathematics and Science at Secondary Level) and PELITA (Quality Improvement of SMP/MTs). At the beginning, we assigned 32 FPMIPA lecturers to collaborate with 500 mathematics and science teachers in 94 Junior High Schools to carry out innovation in mathematics and science learning through hands-on, mind-on, daily life by utilizing local materials as teaching materials in Sumedang District, West Java. Training teachers through lesson study puts more emphasizes on empowering teachers collegially than on instructing them to implement models of instruction. In Lesson Study, teachers and university lecturers collaboratively analyze teaching and learning through the cycle of *Plan, Do, See* to improve the quality of teaching and learning. From Sumedang District, we learned valuable lessons from the SISTTEMS Project that, among others, teacher improved their self-confidence and accountability in facilitating student's learning, collaboration between teachers and school leaders improved significantly, teaching and learning shifted from teacher-centered toward student-centered, teachers became more sensitive to and aware of students' learning problems, students were facilitated to learn collaboratively, student achievement gradually improved, and school image in the community improved significantly. Eventhough external supports have already ended, the schools in Sumedang District still continue to implement *Lesson Study* because the community realize the positive impacts of the practice of *Lesson Study*. Learning from the success of the implementation of *Lesson Study* in Sumedang District as a form of teacher professional development, UPI has expanded the target areas for *Lesson Study* in Indonesia. From 2008 to 2010, with the supports from Sampoerna Foundation, UPI trained 1500 teachers of mathematics, science education, Bahasa Indonesia, and English subjects in Karawang District (West Java province), Surabaya City, and Pasuruan District (East Java province). Since 2010, with the supports from the Directorate of Higher Education and the West Java Provincial Office of Education, UPI has trained 7,000 teachers of elementary, junior high, and senior high schools, and headmasters, and supervisors in 10 districts throughout the West Java province. In 2013, through the collaboration with the Government of Jambi Province, UPI trained 5,000 teachers of elementary, junior high, and senior high schools in 10 districts in Jambi province. In addition, UPI has also implemented the practice of *Lesson Study* to improve university courses in pre-service programs. We would like to extend our thanks and appreciation to all parties that have supported the organization of WALS International Conference 2014. Through this conference, let us strengthen our international network to share experiences and learn from each other to improve the quality of education through *Lesson Study*. We wish you all a fruitful and enjoyable WALS International Conference 2014!

Bandung, 24 November 2014



Prof. Dr. Sunaryo Kartadinata, M.Pd.
Rector,
Indonesia University of Education
(Universitas Pendidikan Indonesia)

On behalf of the Government of the Republic of Indonesia, I happily welcome all the participants of the WALS (World Association of Lesson Studies) Conference from various countries. Welcome to Bandung, Indonesia! In this 21st century, we are facing a complex global competition characterized by the rapid development of technology and multicultural society, and therefore education should provide our students with life skills and career skills having characteristics of flexibility and adaptability, initiative and self-direction, social and cross-cultural skills, productivity and accountability, and leadership and responsibility. To help develop those skills, learning should be carried out in such a way that it can support creativity and innovation, critical thinking and problem solving, communication and collaboration, and information, media and ICT literacy. Therefore, the Government of Indonesia has revised the previous curriculum and developed a new curriculum known by Curriculum 2013 to be implemented comprehensively in 2014. Curriculum 2013 puts emphasis on learning processes because we believe that quality learning processes will result in quality student's achievement too. In learning, students must be facilitated to be able to build knowledge, not to be told. Consequently, the challenge for educators in the primary and secondary levels, and in the university level as well, is to change the paradigm in the classroom from teaching to learning. To implement the new curriculum, we have provided student's book, teacher's book, and we have trained the teachers, principals, and supervisors for one week in all levels of education. The one week training was meant for the socialization of the new curriculum which, afterwards, has to be followed up with continuous lesson studies.

Lesson study is a strategy to improve the quality of teaching and learning through studying the teaching and learning processes continuously by empowering teacher's potentials collaboratively and collegially. Lesson study emphasizes student-centered learning and trains high order thinking skills through daily life approach as well as utilizing local materials. Lesson study also functions as a continuous professional development. Lesson study activities are usually carried out at school so that these activities are relevant and are based on real classroom activities. The Government appreciates all the teachers who have implemented lesson study and we hope that the implementation of lesson study will improve the quality of classroom teaching and learning, and it ultimately will improve the quality of education in the country.

Lesson Study has been introduced in Indonesia since 2006 through the technical cooperation under the support from JICA. Although the supports from JICA ended in 2011, the practice of lesson study did not stop. Lesson study continued in various regions supported by regional government and universities. However, lesson study activities still need to be improved so that lesson study can affect the improvement of the quality of education in Indonesia. WALS 2014 conference organized by UPI has to be used well as a forum for learning from each other and for network building among educators from all over the world.

Last but not least, we would like to thank World Association of Lesson Studies (WALS) and UPI for organizing WALS 2014 conference. We hope that all participants of WALS 2014 conference will obtain invaluable lessons to improve the quality of education their own country.

We wish you a fruitful and enjoyable conference!



Prof. Dr., Muhammad Nasir, Ph.D
Minister of Higher Education, Research and
Technology

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COMBINATION OF PROBLEM-BASED LEARNING AND LOVE IMPLEMENTATION IN LESSON STUDY ACTIVITY TO IMPROVE STUDENTS’ LEARNING RESULT

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Abstract: An effective attempt to improve learning quality is creating good and solid learning community which is also willing to do continuous improvement. This attempt is implemented in lesson study, which covers three main activities, i.e. plan, do and see. The lesson study involves all lecturers belong to the same subject group to work collaboratively based on mutual learning. It has been discovered a root problem of students’ learning in animal physiology I course which required prioritized solution. This problem was the students’ learning achievement in cognitive domain. Learning strategy implemented in this lesson study activity was problem-based learning (PBL) combined with LOVE (*Lembar Observasi Video/Video Observation Sheet*). This approach aimed to improve students’ learning result. Four cycles of lesson study activities was conducted in animal physiology I course in Biology Department, Faculty of Teacher Training and Education, Universitas Ahmad Dahlan, Yogyakarta. The implementation of this lesson study involved a lecturer as a model with 9 observers and 48 students in a class, on March-April, academic year 2012/2013. Data showed that implementation of PBL combined with LOVE improved students’ learning result with the average score of 48,64; 52; 71,9 and 71,7 in each cycle respectively.

Keywords: problem-based learning, love, lesson study, learning result

1 INTRODUCTION

Biology Education Department in Faculty of Teacher Training and Education, Universitas Ahmad Dahlan is one of the Teacher Training Institution that has responsibility for educating professional biology teacher candidates. The major challenge for biology education department was to improve students’ knowledge, competences and skills to comply with national education system. Curriculum analysis was continuously implemented to evaluate the needs of external stakeholders, which includes the Senior High Schools. Teacher candidates have always been familiarized with schools’ curriculum to better understand the dynamic requirements of those schools. Knowledge and skills are major consideration to be continuously improved. In order to conduct the improvement in learning process, lesson study has been implemented.

In lesson study, lecturers belong to the same group evaluated the learning process in the class collaboratively. This activity was based on collegiality and mutual learning principles among the lecturers themselves to create learning community. Lesson study also serves as a tool to aid lecturers in creating high quality of lesson plan as well as a guidance to implement this lesson plan in the class. Lewis et al.

(2006) stated that teachers or lecturers should produce high quality of lesson plan, observe and analyze the actual learning experienced in the class. In that way, teachers will make better implication for the learning design and actual learning process continuously.

Teachers in Japan have implemented lesson study model for decades to evaluate how they manage learning design in the class. Furthermore, teachers in United States of America also found the fact that students’ good score in mathematics subject was related with lesson study that has been implemented previously (Lenski & Caskey, 2009). As reported by Lewis et al. (2006) Lesson study implementation in USA has been the fastest-growing model of teacher professionalism development program. Since 2000, many elementary schools have developed lesson study model for their teachers. This approach helped teachers to create learning community in planning and implementing the lesson plan for their students.

Animal Physiology I is one of the core courses for 4th semester students of biology education department. This course is a pre-requisite for animal physiology II which is offered in 5th semester. Basic competence for this course is to understand physiology concepts in animal’s system and correlation between each system and its application in the real life. Based on the basic competence

formulation, characteristic of this course is in cognitive level C2 and C3 dominantly. However, high order thinking skills have always been a consideration in the learning process.

It has been identified the root problem of students' learning in animal physiology 1 course was learning achievement in cognitive domain. Learning result of this course in the past depicted the students had problem in understanding basic concept and theories of the topic. The difficulties were in extracting information from the textbook or any other learning source which described the topic. Several indicators had been observed to support this conclusion. They were the student's ability to rewrite the concept that has been previously explained was inaccurate, the student's ability to answer short question regarding the concept was low, and the student's presentation of the concepts before their friends was also incorrect. Eventually, their achievements in mid semester examination and or final examination were unsatisfied. However, during the course, some students have shown their best effort to understand the materials by any means, including intensive discussion within student's group. This condition was also observed and considered as the potential answer on the root problem.

Lecturer group discussion as part of the lesson study activity found that Problem-based Learning (PBL) has been considered as a successful and innovative method to assist students in their learning process. This model has opened a new engineering education in accordance with many other learning models with the objective to improve learning quality. Many efforts have been done to clearly define the concept 'problem-based learning'. Howard Barrows, one of the person involved in the development of this model at Mc Master University, Canada, explained the concept in terms of specific attributes as being student-centered, taking place in small groups with the teacher acting as facilitator and being organized around problems (Barrows, 1984 in De Graaff and Kolmos, 2003).

Furthermore, as explained by Hmelo-Silver (2004) that problem-based approach to learning asks the student to experience problem solving so they can learn both content and thinking strategies. PBL is an instructional method in which students learn through facilitated problem solving. They learn complex problem that sometimes does not have single correct answer. They also need to work in group collaboratively to identify what they need to learn in order to solve the problem. Students are engaged in self-directed learning (SDL) and then apply their new knowledge on the problem and the effectiveness of the strategies employed. Teachers role in this method are as facilitator rather than providing knowledge directly to the students.

Ernst & Colthorpe (2008) explained that learning is an active process which involves all learners in many activities to enable them explore and

discover ideas to solve the problems. In this case, problem-based learning approach plays its role in the learning process where learners are exposed to the problem first so they would learn to find to solution.

This kind of active learning was proved to be effective in biology learning process as reported previously (Udovic et al., 2002) to develop students' comprehension on essential biology concepts as well as improve scientific discoveries and critical thinking skills.

In addition, students also needed to improve their understanding on the topic. Due to characteristic of animal physiology course which contains many definition and mechanisms of animal system organs, a full pictures and diagrams explanation solely was not sufficient. At this point, video played important role in complementing learning media for the students. As a treatment to encourage students in extracting information regarding the topic independently, student worksheets were given. This worksheet required students to observe video related to the topic to enhance their understanding on the concept. This worksheet was specially named LOVE (Lembar Observasi Video/ Video Observation Sheet). Implementation of PBL combined with LOVE in lesson study activity on animal physiology 1 course was expected to improve students' learning result.

2 METHODS

Basically, lesson study was conducted in three main activities, i.e. plan, do, and see (reflection). Several previous studies have described the practice of those activities in the class which involves the teachers or lecturers belong to a group. Nahadi (2007) reported the implementation of school-based lesson study with one teacher as a model accompanied by the other teachers in collaboration with lecturers who served as observers. Similar study has also been conducted by Sriyati (2007) who involved high school teachers to be observers in the lesson study activities in accordance with the implementation of classroom action research.

In this study, lesson study activities to improve students' learning result on animal physiology 1 course was conducted in Class B of 2nd year (4th semester) student academic year 2012/2013 with the total number of students was 48. There were one lecturer appointed as a model, 8 observers and one cameraman/photographer to record the whole activities in lesson study. Implementation of the lesson study was from March 11, 2013 to April 3, 2013 divided into 4 cycles of *plan*, *do* and *see* activities. In plan session, all lecturers involved tried to identify the learning problem. They also designed the lesson plan, student worksheet and observation sheet afterward. The observation sheet was used to collect data regarding the student activities during the lesson. In

addition, all student progress and their achievements were also recorded to be analyzed.

The next step was *do*, which means the implementation of lesson study in the class. Also known as open class, a lecturer appointed as model conducted the learning process in the class while at the same time the observers observed the students activities during the lesson. In this session, the role of cameraman/photographer was very important in capturing anything happened in the class as an evident of students responses to the learning model implemented by lecturer.

After the class was over, all observers, a model and cameraman assembled together in lecturer’s room to discuss whatever happened during the open class. This session is known as ‘see’ or reflection. A model was given the first opportunity to express his feeling and thoughts regarding the learning model that had just been implemented previously. The observers gave their opinions and facts they found regarding the student responses, supported by the data they wrote on observation sheets and the video recorded in the class. The discussion in this session produced suggestions for the improvement in learning process on the next cycle.

In this paper, all data were obtained from post-test on each cycle. The test was conducted after the student presentation session so all materials had been delivered and discussed previously within the groups of the students. In order to objectively assess student’s comprehension on the topic, all tests were designed as short essays. The Minimum Completeness Criteria (MCC) was defined at score 70. This was based on the average students score on animal physiology I course in the previous year. The MCC described the student ability to fulfill the basic competences on the course.

On the other hand, observation sheet filled by all observers were also taken into consideration. This described the student responses during the learning model implementation in the class. All observer suggestions were also considered carefully to support the problem solving in animal physiology I course. The data were then analyzed using quantitative description.

3 Results and Discussion

Four cycles of lesson study activities which cover plan, do and see have been conducted. The implementation of Problem-based Learning (PBL) in combination with LOVE (Lembar observasi Video/Video Observation Sheet) have shown an increase both in student learning results and the number of student who pass Minimum Completeness Criteria (MMC) as seen in Figure 1.

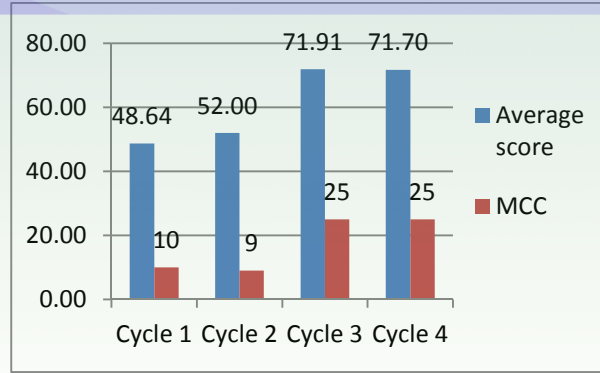


Figure 1. Post-test average score and number of student passing minimum completeness criteria (MCC) on each cycle during lesson study activities in animal physiology 1 course.

Overall, there was an increase in the score average of the students in animal physiology 1 course of 48,64; 52; 71,91; and 71,70 in cycle 1 to cycle 4, respectively. There was also an increase of student number who passed MCC from 10 students in cycle 1 to 25 students in cycle 4.

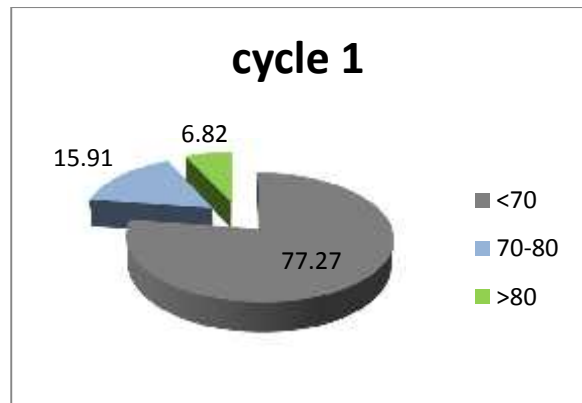


Figure 2. Students score proportion (%) in cycle 1 of lesson study activity.

Post-test average score obtained by students in cycle 1 was the lowest (48,64) with only 10 students pass MCC. This reflected the general capability of the students to understand the materials was low.

In fig.2, score proportion showed that more than 77 percent of the students have not passed the MCC which was set at score 70. Only 15,91 percent of the students got average score in range of 70-80, while only approximately 6 percent of the students had the highest average score of more than 80.

Topic delivered in cycle 1 was about human digestive system. Based on the lecturers discussion in plan activity, it was decided to give the student general overview of the material first, followed by distributing students worksheets to each group. Focus group discussion (FGD) was undergone intensively under the supervision of lecturer. In this session lecturer acted as facilitator to guide the students working on

their assignments. Video material contained brief explanation of the topic was also distributed to each group to help the students answering related questions in their worksheets. It was observed clearly that students' response to this approach was not very satisfied. They seemed to be unfamiliar to learn in such environment that required them to extract information from many learning sources and then discussed it in the group. Conventional learning model that was usually conducted in the class made the students acted passively. This contributed to the lowest achievements of the average scores and number of students achieving MCC in the first cycle.

Reflection discussion on the first cycle found that this approach should be continued in the next cycle. What needed to be improved was the general explanation from the lecturer which should cover details on the topic prior to ask the students extracting information from the video. Post-test was also needed to be more specific to the topic so that students would have less difficult in answering the questions.

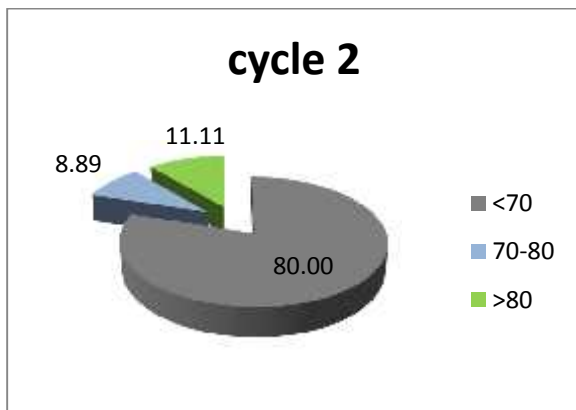


Figure 3. Students score proportion (%) in cycle 2 of lesson study activity.

The second cycle showed an increase in the post-test average score. This depicted that students understanding to the topic was generally improved. They started to be familiar with the PBL approach in learning process. In this way, PBL could serve as an advancement tool in learning as previously reported by Hillman (2003). Video materials were also helpful in supporting the students' comprehension on the topic. However, the student number passing MCC was slightly decline to 9 from 10 in the previous cycle. Only 20 percent of the students completely fulfill the basic competence of the course (fig. 3). Despite the decline, there was an increase in the percentage of the students obtained the highest average score of more than 80. Topic of this session was about human respiratory mechanism. Complexity of the topic could also contribute to the students difficulties in understanding it.

Reflection discussion of the lecturer and observers recommended the use of more diagram and pictures to assist the students. It was concluded that in explaining mechanisms, video played important role to enhance students' comprehension. Therefore, the next cycle should also deliver the material in the form of video. The LOVE worksheet also described the students' improvement in extracting concepts and theories of the topic more accurately. A group of students was also identified as having difficulties more than any other group. This group showed sluggishness in the process. It turned out the member of this group was the repeater students, who did not successfully pass this course last year. This group needed more concern and guidance from the lecturer that served as facilitator.

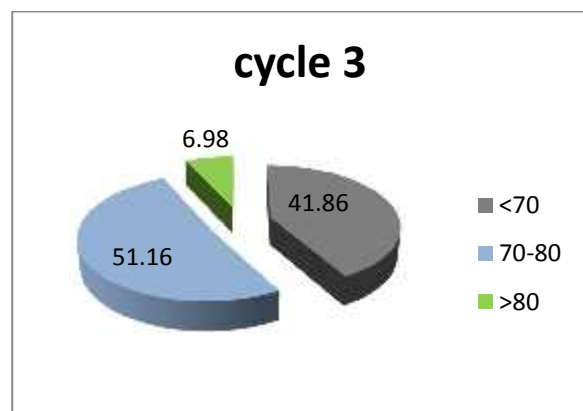


Figure 4. Students score proportion (%) in cycle 3 of lesson study activity.

In cycle 3, as depicted from fig. 1 and 4, students average score reached the highest point at 71,91. Number of students achieved MMC also increased sharply from 9 in cycle 2 to 25 in cycle 3. Students' score proportion described the number of students passed MMC was almost 60 percent compared to the previous cycle which was only 20 percent.

Implementation of PBL seemed to increase not only students' comprehension on the materials, but also the students' independence in learning process. They were no longer entirely depended on lecturer, instead, they experienced the way of extracting information directly from various learning sources, including video. They were also trained on how to express the ideas in the group and combining the concepts they found to understand the topic. At the end of FGD, a representative of each group presented the concept before his/her friends in order to get feedback. This session was also useful for the lecturer to monitor the students' comprehension and to make any revision when misconception occurred. In this cycle, students seemed to be more prepared in discussing the materials with group members. Topic delivered in this cycle was still about respiratory

system, with subtopic lung volume and respiratory regulation. The problem in the worksheet was related to the daily life. In this case, students could get real example of the topic to support their comprehension. There were no substantial misconception or difficulties experienced by the students suggested that this cycle was better than the previous cycles.

PBL approach was helpful for the students in their learning process. However, when setting the students on a problem solving course, they don't know what to do at first. In this case, lecturer needs to provide facilities so they can find out information to solve the problems (Johnston, 1997 in Hillman, 2003). Video served as the best facility to support the explanation of mechanisms or process rather than just images or pictures alone. The video observation sheet (LOVE) was proved to assist students in understanding the topic.

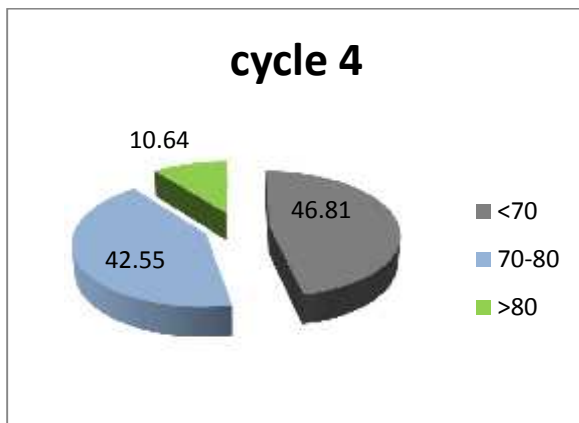


Figure 5. Students score proportion (%) in cycle 4 of lesson study activity.

The fourth cycle of lesson study activity was conducted in the topic cardiovascular physiology. This topic was known to be intricate due to many concepts that required detail observation and thinking from the students. The use of video in explaining the cardio cycle was very substantial. It was found that students' post-test average score was slightly reduced compare to the third cycle (fig. 1). However, the number of students passed MCC was equal to the previous cycle. Score proportion (fig. 5) depicted the increase number of students who obtained the score above 80. The students' number percentage in cycle 4 was decrease in MCC compared to cycle 3 due to the unequal number of total students' presence in those cycles. In last cycle, there were 47 students compared to 43 in third cycle.

In the reflection session, all lecturers evaluated the PBL implementation with the use of LOVE to assist the students achieving the best result. They concluded this approach was significant in improving students' learning result. In accordance to this conclusion, Hmelo-silver (2004) explained that as

a matter of fact, PBL can help students develop: flexible knowledge, effective problem-solving skills, self-directed learning skills, effective collaboration skills, and intrinsic motivation.

In order the students to be successfully learn in PBL environment, there are 7 steps that were suggested, i.e.:

1. Students need to clarify the concepts
2. Students need to define the problem clearly
3. Students analysis on the problem
4. Students find the explanation
5. Students formulation of the learning objective
6. Students need to search further information
7. Students need to report and test new information accurately.

Eventually, using PBL, students become lifelong learners who have learned to take responsibility for their own learning process (De graaf and Kolmos, 2003).

In addition to that, determining MCC should be more comprehensive to get the most objective point. Nasirullah (2013) stated that deciding the MCC was complex. Many things should be taken into considerations, such as complexity of the course, facilities that support the learning process and the individual capability of the student. In this case, through lesson study, lecturers have the opportunity to learn and discuss more about setting up the MCC objectively.

At the end, lesson study activity was a significant attempt not only to improve professionalism of lecturers, but also to increase the students' learning quality. As previously explained by Lenski and Caskey (2009), lesson study activity was very helpful to improve lecturers'/teacher's professionalism by constructing, organizing, sharing, and sharpening their knowledge in learning process. Therefore, plan, do and see need to be implemented appropriately to solve students' learning problems and at the same time, help them achieving the expected competences.

4 CONCLUSIONS

Combination of PBL with LOVE implemented in lesson study activity improved the students' learning result. PBL approach in learning has opened up students' mind to significantly develop their knowledge, self-directed learning skill, collaboration skill and also problem-solving skill that made them a lifelong learners. Moreover, lecturers' professionalism through working collaboratively in plan, do and see activities was also improved. In lesson study, there was wide opportunity for the lecturers to develop skills in planning, implementing

and evaluating the learning strategies to improve learning quality.

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6 REFERENCES

Barrows, H.S. (1984). A specific problem-based, self-directed learning method designed to teach medical problem-solving skills, and enhance knowledge retention and recall, in De Graaff , E & Kolmos, A. (2003). Characteristics of problem-based learning. *Int. J. Engng Ed.* 19(5), 657-662.

De Graaff , E & Kolmos, A. (2003). Characteristics of problem-based learning. *Int. J. Engng Ed.* 19(5), 657-662.

Ernst, H. & Colthorpe, K. (2008). Expanding voluntary active-learning opportunities for pharmacy students in a respiratory physiology module. *American Journal of Pharmaceutical Education* 72 (2).

Hillman, W. (2003). Learning how to learn: problem based learning. *Australian Journal of Teacher Education.* 28(2), 1-10.

Hmelo-Silver, C. E. (2004). Problem-based learning: what and how do students learn? *Educational Psychology Review.* 16(3), 235-266.

Johnston, L. (1997). Expedition of discovery: architectural education at Newcastle, in Hillman, W. (2003). Learning how to learn: problem based learning. *Australian Journal of Teacher Education.* 28(2), 1-10.

Lenski, S.J. & Caskey, M.M. (2009). Using the lesson study approach to plan for student learning. *Middle School Journal. ProQuest Education Journals.*

Lewis, C. Perry, R. Hurd, J. & O'Connel, M.P. (2006). Lesson study comes of age in North America. *Phi Delta Kappan* (88): 273-281.

Nahadi. (2007). Peningkatan kualitas pembelajaran melalui program lesson study berbasis sekolah

(LSBS). *Jurnal ABMAS. Universitas Pendidikan Indonesia.* 7(7): 1-4.

Nasirullah, M. (2013). Penetapan nilai kriteria ketuntasan minimal dengan teknik delphi di SMA negeri kabupaten pamekasan. *Jurnal Kebijakan dan Pengembangan Pendidikan.* 1(1): 35-41.

Sriyati, S. (2007). Peningkatan profesionalisme guru dan kualitas pembelajaran biologi di sekolah melalui lesson study. *Jurnal Pengajaran MIPA. Universitas Pendidikan Indonesia.* 9(1).

Udovic, D., Morris, D., Dickman, A. et al. (2002). Workshop biology: demonstrating the effectiveness of active learning in an introductory biology course. *Bioscience.* 52(3): 272.