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Scientific Article "Lesson Study": Portrait of Improving the Teacher Learning Quality

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Abstract
The aim of this research is: photographing the teacher's lesson study learning process, as well as evaluate information findings resulting from LS scientific article preparation activities. This research is based on a phenomenological approach, which focuses more on phenomena that are felt, obtained, responded to, perceived by subjects (humans) towards objects (LS scientific articles) written by teachers. The results of LS teacher's writing of scientific articles, are the result of narrating the implementation of lesson study, producing several findings, namely: firstly, they have writing skills to narrate teaching experiences. Some teachers are doing this skill for the first time. Second, photographing LS activities to narrate in articles, provides an interesting and challenging experience. Third, being able to present learning activities to be published as work results is a source of pride for teachers. Fourth, considering that LS activities are personal experiences, conveying them in written form is like telling a story. Fifth, encourage collaborative writing, as a result of collaborative LS experience, and the results of collaborative work. Sixth, preparing LS articles encourages teachers to look for lots of references, so that good LS articles are produced. Seventh, articles that are prepared collaboratively produce rich ideas, because they create an exchange of ideas to produce better articles. Eighth, there is a correlation between the lesson study stages, the problems that will be solved through learning, and the learning strategies carried out by the teacher. Ninth, LS activities will become teacher best practices in learning, when written in a scientific article. This LS scientific article expands information on the success or best practice of learning for many people. Tenth, the quality of the scientific articles produced is a portrait of the mastery of the lesson study that has been carried out. Suggestion: it needs to be used as a habit for lesson study activities which have an impact on writing scientific articles. The aim is to improve writing skills for teachers, while encouraging collaborative work as a habituation process, as well as training that learning experiences can become best practices that can be disseminated as more useful information.

Keywords: Lesson Study Article, Portrait, Learning Quality, Teacher.

Introduction

The 21st century learning requires teachers to always make transformation and enhancement their own competence, especially in learning. Moreover, teachers have a strategic role because they have a lot of time to meet with their students. Learning in the 21st century requires teachers to implement the character skills including: Critical Thinking, Creativity, Collaboration, and Communication (4 Cs). The 4 Cs above are expected to be implemented in teacher activities during teaching. The character of 21st century learning, provides direction for the implementation of problem-based learning, to encourage students to solve the problems they face, as well as future needs.

In the 21st century, students are faced with complex problems, which require complex solutions. Teachers are required to have the ability and skills to select an appropriate learning approach. Assessment of current problem solving and critical thinking skills is a component of learning material achievement, as a different 21st century learning, (Scardamalia & Bereiter, 2003). Recommended learning models include: Inquiry Learning, Discovery Learning, Project Based Learning (PjBL), Product Based Learning (PBL), etc. Teacher creativity is really needed, so that learning is interesting, meaningful and beneficial for students' lives. The class belongs to the teacher and students, so teachers must involve students in learning, including assessment. Active learning will become the character of the class and encourage the creation of a communicative class atmosphere.

The explanation above is very relevant to lesson study activities. Lesson Study (LS) is a model for developing the teaching profession through collaborative learning assessment. LS accommodates the implementation of sustainable learning based on the principles of collegiality and mutual learning to build a learning community (Hendayana et al., 2006; Kyaw, 2022; Schipper, 2019). LS will encourage improvements in the quality of learning, both teachers and students will be collectively involved in learning (Dudley et al., 2019).

LS activities include: planning (PLAN), observation (DO), and reflection (SEE). The above activities will always be repeated on an ongoing basis, because after the SEE activities, teachers receive recommendations as a result of evaluating the learning they have carried out. Teachers will make improvements to learning strategies (Lee Bae et al., 2016; Lewis et al., 2019). Teachers will always make transformation and improvements to their learning strategies, with the expectation that there will be improvements and enhancement. Implementing LS provides opportunities for teachers to become educators as well as learning researchers, so that teachers will always be active in making transformation, as a result of recommendations for their learning research, (Winaryati et al., 2023).

Not many teachers explore the implementation of lesson study, to make it into a scientific article. In this regard, the research team has carried out community service activities at 40 Muhammadiyah schools throughout Central Java. Each school established a Lesson Study for Learning Community (LSLC), which consists of model teachers, observer teachers and school principals. The activities are the preparation of design chapters and design lessons (PLAN), teacher teaching models (DO), and learning reflection (SEE). Recommendations for learning improvements are feedback from REFLECTION activities regarding the implementation of learning that has been carried out. After the activity, teachers were asked to compile it into a scientific article as best practice for implementing lesson study by the LS team, (Winaryati et al., 2022).

Theoretical Support

In the 21st century, there has been a development of systems, where teachers are involved in research about their teaching practices. There has been an increase in the role of teachers in developing educational knowledge. Apart from teaching, teachers also learn, so that there is a new understanding of how teachers learn best. Teachers as researchers and contribute to the field of education in a more scientific way (Lynch & Sell, 2014). Teachers and lecturers work together in partnership to enhance learning, and complement each other. Teachers are jointly involved in discussing theory, practice, learning needs and conducting learning research (Jaworski, 2008). Learning research is carried out by teachers to increase their knowledge about teaching methods and content, (Bartolini et al., 2017).

Sell, (Sell, 2013) stated that in the 21st century there has been school reform where teachers are required to adapt to new and developing environments. Teachers have a role in producing, transferring and transmitting knowledge as a result of their research in schools. Ananin, & Lovakov, (Ananin & Lovakov, 2022), that in the global era teachers need to build a stable research community through collaboration of allied teachers. Teacher professional growth, through research involvement needs to be encouraged to occur sustainably to achieve more realistic goals, through the collective efforts of external support, school leaders and teachers (Kyaw, 2022). There is a need for discussions between experts and novices that allow discussions about the implications of learning for improving teachers and professional development, (König et al., 2022). Collaboration between teachers and prospective teachers, through productive and dynamic work procedures in research, has encouraged the search for academic literature to answer problems in the classroom (Lauer & Ariew, 2022).

Research Gap

Student ability scores in several ASEAN countries in PISA 2018 placed Indonesia in the bottom 10 of 79 participating countries. The average reading ability of Indonesian students is 80 points below the OECD average. The average reading, mathematics and science abilities of Indonesian students are 42 points, 52

points and 37 points below the ASEAN student average, respectively (OECD, 2019a, 2019b). Poor reading skills will have an impact on writing skills. The above issues encourage teachers to have reading and writing skills, so that they have sufficient knowledge and skills to convey to their students.

The data above is reinforced by research results that genre writing skills for teachers are a challenge, because they require a high level of content knowledge. Genre writing requires absorption from a variety of other disciplines and broader knowledge, to be taught to students (Worden, 2018, 2019). Teachers still have difficulty conducting research and writing scientific articles (Admoko et al., 2021). This is in line with the research results of Juniardi and Irmawanty (Juniardi & Irmawanty, 2019) and Juniardi, Irmawanty, & Aulia (Juniardi et al., 2021), that teachers have difficulty doing research, especially their mastery of research methodology and difficulty in analyzing data on discussions.

The explanation of some of the literature above is the basis for exploring the findings from the experience of implementing lesson study in the field. Information exploration becomes an interesting experience to be compiled into a teacher's scientific article. This best practice can be a good lesson for yourself and other teachers. Based on the explanation above, the aim of this research is: photographing the LS learning process by teachers, as well as evaluate the information findings produced from the activities of preparing LS scientific articles.

Method

This research method focuses more on the evaluation of model teachers, observer teachers and school principals on the results of the scientific articles they have prepared. The research method used is based on qualitative data as an effort to build understanding of individual experiences related to the information and meaning experienced during LS activities. This activity produces information buildings so that they are able to present complex representations of information experiences (Prasetyawan, 2019). The approach method is to explore the information obtained from each stage of the lesson study carried out by the Central Java Muhammadiyah School LS Team. The basis of this approach is the reason for selecting the phenomenographic method (Yates & Partridge, 2014).

This type of research is based on a phenomenographic approach. Marton, (Marton, 1986, 2000), claimed that the phenomenographic approach focuses on phenomena that are felt, obtained, responded to, perceived by subjects (humans) towards the objects (LS scientific articles) they write. This is in line with Bruce (Bruce, 2002), which is described in a relationship between the subject and the object. This phenomenographic approach is constructivist-interpretive. Constructivism is a finding as a result of the formation or construction of experience (Vygotsky, 1935). Interpretative is interpreting behavior and values by direct observation (Neuman, 1997).

Phenomenography is an approach that examines information experiences (Information Literacy and Informed Learning), as individual experiences about a phenomenon. Phenomenography as a way to reveal various individual experiences to map qualitatively different ways in which people experience, conceptualize, perceive and understand various aspects and phenomena related to lesson study activities. Investigating the experiences of different teaching and learning activities, experienced by teachers, students, school principals and researchers themselves.

Results and Discussion

The learning is based on the implementation of lesson study activities in 40 LS Teams of Muhammadiyah schools throughout Central Java, which have produced 40 LS scientific articles. This article is a teacher's best practice regarding LS that has been implemented, as well as the result of his understanding and mastery of LS implementation. The LS article narrates the implementation of the plan, do and see that has been implemented, (Winaryati et al., 2022).

Implementing LS in Scholl

Collaboratively, the LS Team identified the learning problems faced and solutions will be sought. The teacher's teaching orientation places students so they can solve the problems. Collaboration is the key in implementing lesson study, which places more emphasis on solving learning problems, as well as the increasingly complex demands of future needs. The activities that occurred are the process of solving problems, giving each other input, providing information based on arguments based on existing literature studies, to get the best solution, as well as the experienced of each teacher. This activity occurred when

compiling learning scenarios in the form of lesson design and chapter design. Activities during PLAN are very full of learning problem solving activities to find solutions scientifically and responsibly, as part of the research character. Research has the aim of finding answers to problems or discovery processes, through an investigation process. Investigation is an effort to search and collect data, information and other findings to obtain the truth. The character of this research is in the plan activity.

At the DO stage, there were collaborative activities carried out by the lesson study group, with details of 1 person as a model teacher, and several teachers and the principal as observers. Observations are made using tools in the form of cameras or cellphones or notes, to obtain field data related to student data. This activity is very full of research, because it used data collection techniques both qualitatively: field notes, photos, videos, documents, interviews and quantitative data if deemed necessary such as: questionnaires, checklists, self-assessments (student work, projects, performances), sociogram, portfolio, etc. The field data collection techniques above are really needed during observation activities carried out by observers.

At the SEE (Reflection) stage, the entire lesson study team gathered to convey and discuss the results of observation findings regarding attitudes, responses, behavior, understanding of concepts, etc. Analysis of these findings produced input as an evaluation which resulted in several recommendations. Recommendations have an impact on learning improvements that will be carried out in the future. All LS members involved individually received a lot of information to improve media, materials, methods, strategies including learning assessment. These recommendations will become material for planning the next lesson. Blandin & Lietaer, (Blandin & Lietaer, 2012), stated that it is necessary for teachers to produce as many creative and collaborative knowledge builders as possible. The need to explore the possibility of using mutual learning as a systemic means of improving learning.

Preparation of LS Scientific Articles

The LS activities that have been carried out are narrated by the LS Team including plan, do and see, in a scientific article. The articles compiled by the LS TEAM were very diverse, which determine many things. The lecturer was a companion when compiling this LS article. The articles that have been produced were helped to be published in scientific journals. This scientific article was a portrait of how far the LS Team's understanding about the LS they have implemented.

From the results of interviews and discussions during mentoring, several things resulted in scientific articles being produced. The quality of articles was greatly influenced by internal and external motivation, including (1) teacher enthusiasm in carrying out lesson study activities; (2) encouragement and motivation of the school principal; (3) persistence in assisting LS and preparing scientific articles; (4) LS team collaboration; (5) IPR targets and publications produced as output from the team's LS implementation; (7) teacher writing skills. The data above was obtained from observations during LS activities and the results of teacher responses during the mentoring activity process.

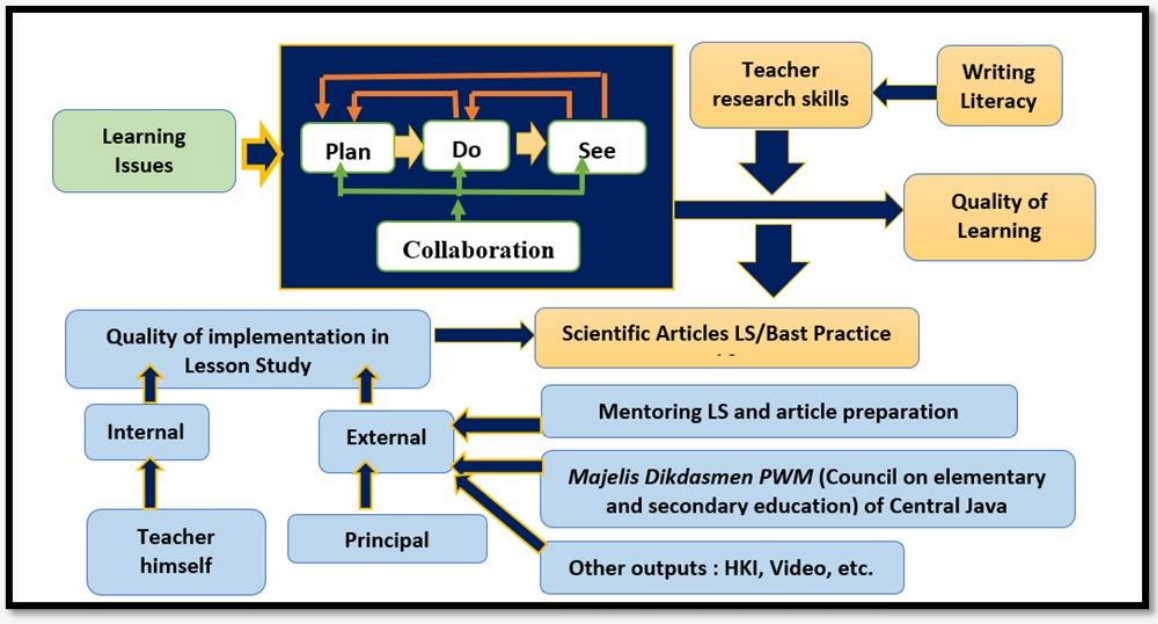

Figure 1. Illustration of the direction of influence of the strength of scientific articles

Among the articles that have been produced by teachers are: (1) "Cooperative Method" in the Implementation of Learning Material "History of the Entry of Islam in Indonesia" Through Lesson Study, (2) Verbal Cards to Improve Students' Writing Comprehension in Passive Voice; (3) Analysis of Student Responses in the Implementation of Exploring the Twists and Turns of the Majapahit River of Life in Each Phase of Plan, Do, See in the Center for Excellence Vocational School Curriculum; (4) Mathematics Learning in the Application of SPLDV Story Problems for Class X Students at SMK Muhammadiyah Rembang; (5) Analysis of Critical Thinking Skills on Fraction Material using the Inquiry Method through Lesson Study at Mapans Elementary School; (6) Application of Tharah Learning Based on ICT-Assisted Problem Solving through Lesson Study; (7) Improving Students' Motivation in Learning English Using Digital Platform: A Lesson Study in SMK Muhammadiyah Bumiayu; (8) Ability to Write Short Stories in Class IX Students of SMP Muhammadiyah 2 Boyolali Special Program; (9) Analysis of Communication Skills in Class X Vocational School English Self-Introduction Learning; (10) Implementation of Lesson Study in Mathematics Learning Using the Problem Based Learning (PBL) Learning Model on Matrix Material; (11) Increasing Students' Creativity in Arranging Series and Parallel Electricity in a House Plan; (12) Creativity Skills in Implementing Descriptive Text Based on Small Group Discussions in Each Phase of Lesson Study; (13) Implementation of Lesson Study to Improve Students' Literacy Understanding in Class X Digital Simulation and Communication Subjects using the Problem Based Learning Model; (14) Implementation of Lesson Study through the Problem Based Learning Model, Material for Analyzing Problems in Motorcycle Brake Systems; (15) Learning Mathematics Material on Fractions using the TGT (Teams Game Tournament) Method through Lesson Study; (16) Increasing students' speaking courage through lesson study in English language learning for students; (17) Creativity Skills in Implementing Descriptive Text Based on Small Group Discussions in Each Phase of Lesson Study; (18) Analysis of Discussion Communication Skills in Plan, Do, See on Material Understanding Locations Through Maps in the Digital Era 4.0; (19) Analysis of Students' Understanding of Absolute Value; (20) Implementation of Lesson Study in Learning Sets Through the Interaction of Living Things with the Environment; (21) Implementation of Lesson Study through the Number Head Together Learning Method Material for Class 1 Pancasila Symbols; (22) Implementation of Lesson Study in Mathematics Learning Using the Problem Based Learning (PBL) Learning Model in Matrix Material; (23) Implementation of Lesson Study in an Effort to Improve the Quality of Learning in Observation Report Text Material; (24) Analysis of Communication Skills in Learning English Self-Introduction; (25) Implementation of the Group Investigation Model in Learning the Particles that Make Up Material as an Effort to Increase Science Learning Activities and Achievement; (26) Show and Tell Method in Lesson Study to Train 21st Century Skills in Elementary Schools; (27) Implementation of Lesson Study through the Stad Learning Model (Student Teams Achievement Division) Exponent Material; (28) Implementation of lesson study through the CRH (Course Review Horay) learning model on multiplication material without memorizing; (29) Revealing Diction in Poetry Using the Cooperative Integrated Reading and Composition (Circ) Method through Lesson Study, etc.

Results of Teacher Responses to the Scientific Articles They Compiled

After writing the LS scientific article which has been prepared by the teacher together with the school team, assistance was provided by the lecturer. There were several notes that could be summarized. Notes were obtained from the results of filling out the instrument and corroborated by interviews related to responses to the articles they had written. Based on data from responses, input and impressions by teachers regarding the preparation of lesson study scientific articles, the following data was obtained: Firstly, they had skill of narrating teaching experiences. Observing the low level of writing skills among students (as a result of assessment by PISA), writing skills had become a demand. Secondly, took photos of LS activities to be narrated in articles, providing an interesting and challenging experience. Thirdly, being able to present learning activities to be published as work results was a matter of pride for teachers. Fourth, several teachers said that this was the first time they had written an article that described learning activities. Fifth, the skill of improvising recording results to be presented as findings that had an impact on recommendations. Teachers had interesting experiences related to the skills of recording student activities in teaching and learning activities, which had an impact on developing teaching styles and being able to find out students' needs in more detail. Sixth, LS activities encouraged teachers to narrate every process they experienced themselves, so that when they wrote down the process that occurs, it was like telling a story. However, some teachers had difficulty improvising/developing a framework for writing ideas. Seventh, the enthusiasm for research increases. This was because LS activities provided opportunities to solve problems collaboratively, including writing articles collaboratively. Eighth, preparing LS articles encouraged teachers to look for lots of references. Teachers had difficulty getting ideas to turn into topics, because the references that teachers read

were still lacking. Difficulty getting appropriate references that match the essence of the article to be analyzed. LS encouraged teachers to have adequate references, so they can design lesson studies and apply them well. Ninth LS activities would become teachers' best practices in learning, if written in a scientific article. This LS scientific article expanded information on the success or best practice of learning for many people. Tenth, articles prepared collaboratively, produced rich ideas. There was a habit of discussing with other teachers in developing the best learning for students. Creating an exchange of ideas to produce better articles. Eleventh, the quality of the scientific articles produced was a portrait of the mastery of the lesson study that has been carried out.

Based on the explanation above, it can be concluded that there is a correlation between the lesson study stages, the problems that will be solved through learning, and the learning strategies carried out by the teacher. LS activities will become the teacher's best practice in learning, even though they are written in a scientific article. This LS scientific article expands information on learning success for many people. Illustratively, it can be described as follows:

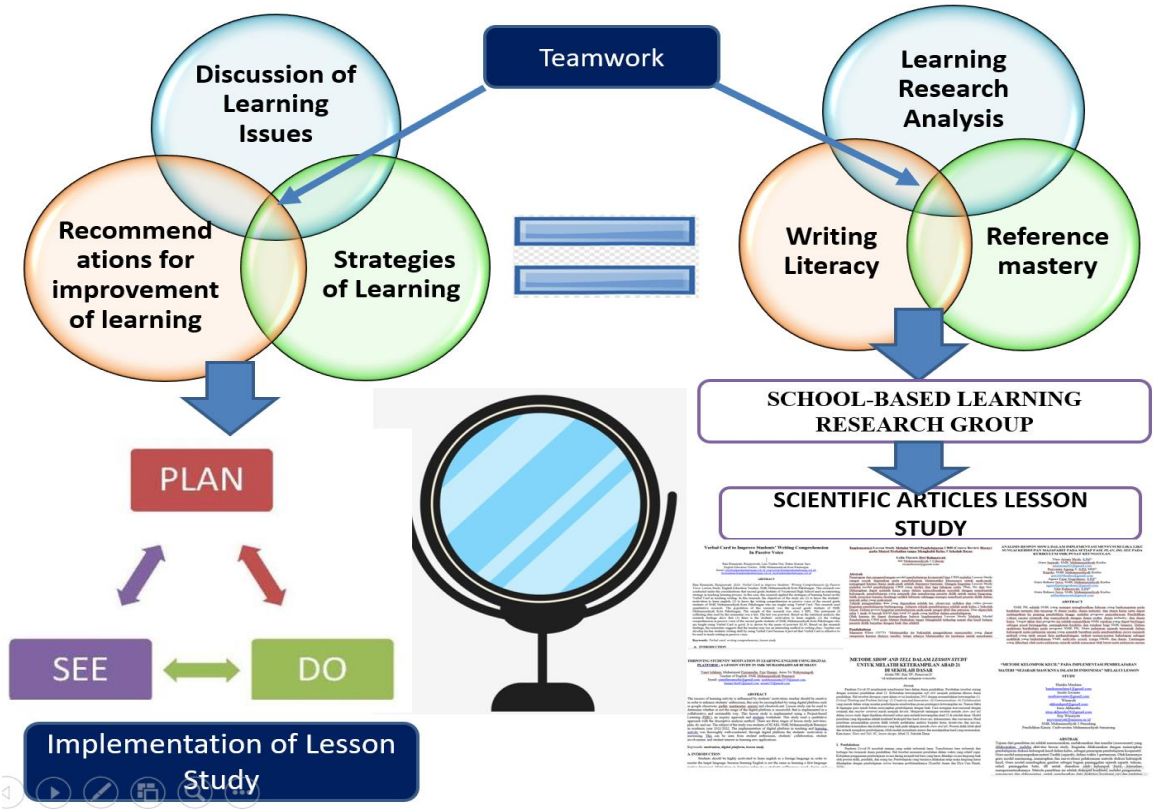

Figure 2. Portrait of Improving the Quality of Teacher Learning Through LS Activities

The picture above provides the following picture: The LS team will discuss learning problems collaboratively, in the implementation of Do observations are made of students so that learning findings are produced, and SEE produces recommendations for learning improvements. Simultaneously, a solution strategy is also collaboratively produced, then learning information findings are also produced, to produce learning recommendations. The activity above was written in an LS scientific article by the teacher. The quality of the scientific articles produced is a portrait of the mastery of the lesson study that has been carried out. Writing LS articles is in line with what was conveyed by Scardamalia & Bereiter, (Scardamalia & Bereiter, 2003), that involvement in the knowledge development process results in the production of public knowledge, including scientific article products. This will produce information of value to others so that the process of collective responsibility for the advancement of knowledge can take place.

Conclusion

The Lesson study scientific articles produced by teachers, as a result of narrating the implementation of lesson study, produce several findings, namely: firstly, they have writing skills to narrate teaching experiences. Some teachers are doing this skill for the first time. Secondly, photographs of LS activities to be narrated in articles,

providing an interesting and challenging experience. Third, being able to present learning activities to be published as work results is a source of pride for teachers. Fourthly, considering that LS activities are personal experiences, they are conveyed in written form as if telling a story. Fifth, encourage collaborative writing, as a result of collaborative LS experience, and the results of collaborative work. Sixth, preparing LS articles encourages teachers to look for lots of references, so that good LS articles are produced. Seventh, articles prepared collaboratively produce rich ideas, because an exchange of ideas is created to produce better articles. Eighth, there is a correlation between the stages of learning, the problems that will be solved through learning, and the learning strategies carried out by the teacher. Ninth, LS activities will become teachers' best practices in learning, even though they are written in a scientific article. This LS scientific article expands information on the success or best practice of learning for many people. Tenth, the quality of the scientific articles produced is a portrait of the mastery of the lesson study that has been carried out. There is a correlation between the lesson study stages, the problems that will be solved through learning, and the learning strategies carried out by the teacher. LS activities will become the teacher's best practice in learning, even though they are written in a scientific article. This LS scientific article expands information on the success or best practice of learning for many people. The quality of the scientific articles produced is a portrait of the mastery of the lesson study that has been carried out.

Suggestion: it needs to be used as a habit for lesson study activities which have an impact on writing scientific articles. The aim is to improve writing skills for teachers, while encouraging collaborative work as a habituation process, as well as training that learning experiences can become best practices that can be disseminated as more useful information.

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