



Sustainability of Lesson Study on The Lesson Study for Learning Community (LSLC) Program in Batu City East Java Province

Moch. Agus Krisno Budiyanto¹, Abdulkadir Rahardjanto^{2*}, Samsun Hadi³, H. Husamah⁴

^{1,2,3,4} Department of Biology Education, Universitas Muhammadiyah Malang, East Java, Indonesia

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ABSTRACT

LSLC was an innovative learning program. Much research has been done regarding the implementation of LSLC, but few have focused on its sustainability. This study aimed to discover the sustainability of LSLC in Batu City. This study was a quasi-research using multivariate multidimensional scaling analysis. The population used was all the piloting LS schools and LSLC experts from universities. The results obtained present a good result on the development side of students' cognitive, affective, and psychomotor domains. Good development was revealed in the dimensions of pedagogic, competence, and commitment. In the subsidy and socio-cultural dimensions, shows unfavorable results and requires serious attention. It can be concluded that the sustainability of LSLC requires special attention to several dimensions. Therefore, various studies that can be focused on that dimension need to be done, so that the right model/solution can be found to ensure the sustainability.

1. Introduction

Development of Lesson Study (LS) is based on the didactic situation theory which has the hypothesis that teachers' professional knowledge is developed through action, interaction, formulation, validation, and didactic institutionalization in their learning environment (Wood, 2018). LS reveals a collaborative collaboration among the teachers and other education activists (Chenault, 2017; Gutierrez, 2015; Merga, 2019), in which it focuses on the teacher professional learning and students' learning (Coenders & Verhoef, 2019; Purwanti & Hatmanto, 2019; Uştuk & Çomoğlu, 2019). The scope of the LS more leads to ontology on the learning difficulties (Norwich & Jones, 2012; Rappleye & Komatsu, 2017).

LS more sharply due to the use of this program can: (1) see in detail and sharply if it is compared with the learning in general. (2) see the gap between the assumptions that the teacher imagines when the students learn and what actually happens when the students learn. (3) discover how to plan the lesson that is suitable with the students' needs and (4) alter the teaching patterns by giving more emphasis on how the students learn (Dudley, 2013). The activities carried out by the teachers on LS can develop theoretical coherence and build up a better pedagogical system (Bjuland & Mosvold, 2015; Ngang & Sam, 2015; Tan et al., 2019). The teachers can develop broadly the cognitive function of students so that it can underlie the architectural thinking and behavior patterns (Baymuradovna et al., 2020; Lofthouse & Cowie, 2018; Widoretno & Dwiastuti, 2019). This development requires supportive system that is complex on the field implementation (Alamri, 2020; Angeles & Matsuura, 2020; Cresswell et al., 2013; Kaen et al., 2011; Kanellopoulou & Darra, 2019).

Therefore, supportive study of LS is an interdependency of brain ware, hardware, funding, and networking of educational stakeholders (Hindun et al., 2019; Miharja et al., 2017; Nurwidodo, 2016a, 2016b; Nurwidodo et al., 2018). This system will be sustainable if the supportive program has a dynamic ability that is active in regulating itself. Handling that is not well integrated between the LS and the current Curriculum of 2013 can cause a conflict of interest (Rahardjanto & Susilowati, 2018).

In a more specific context, several schools in Batu City, East Java Province have collaborated with related universities independently and took the initiative to implement the Lesson Study for Learning Community (LSLC) program. The ability of education managers to independently regulate LSLC will be

*Corresponding author.

E-mail addresses: abdkadir@umm.ac.id (Rahardjanto)

able to determine the sustainability of the program being carried out, so this needs to be studied specifically and comprehensively as a basis for policy making and future (sustainable) reflection.

However, studies on the potential for the sustainability of LSLC - which can be both best practices and reflections - have not been widely carried out, and can even be categorized as rare. Several LSLC studies (in international publication context/reputable) are more focused on [concepts \(Lim-Ratnam et al., 2019; Saito & Atencio, 2015; Sato, 2018; Tsukui & Murase, 2018\)](#), activities, implementation of learning, and LSLC initiation in schools ([Haerullah et al., 2019; Herliani & Masitah, 2018; E. W. K. Lim, 2015; Merdekawati, 2020; Purwandi et al., 2020; Rozimela, 2018; Saito & Atencio, 2015; Saito & Sato, 2012; S. Suratno et al., 2020; T. Suratno et al., 2019; Yuniar et al., 2020](#)), process of assessing and the implementation LSLC ([Setyawan et al., 2019](#)), and ideas about the importance of networking ([Nurwidodo et al., 2018](#)). Especially in Batu City, there is only one study that has focused on the implementation of LSLC since 2016 ([Hindun et al., 2019](#)). Of course, this will be a problem for efforts to maximize the impact of LSLC because implementation problems in the field are not mapped.

In this connection, this study aims to determine the index of sustainability of the LSLC program in Batu City, East Java Province. The contribution of the results of this study is to provide an overview of the potential sustainability of the LSLC program in Batu City which is based on innovative and independent activities of schools involved in teaching in schools. The results of this research will serve as signposts for LSLC activists, the government or policy makers, LSLC experts, and schools in implementing appropriate and sustainable LSLC (which has the maximum impact on improving the quality of education and learning in schools).

2. Methods

This study has respondents of all piloting LS schools in Batu City and the experts of LS who are active in LSLC activities in Batu city. The instruments of study used to grab the data are by using questionnaires and observation sheets of program sustainability developed based on the sustainability model of RAPRiCons, of which model is developed by ([Rahardjanto, 2015](#)) using modification of dimensions, namely: (1) Pedagogic Dimensions, (2) Competence Dimensions, (3) Socio-Cultural Dimensions, (4) Commitment Dimensions, and (5) Subsidy Dimensions. The five dimensions developed are characteristics of the sustainability of the education sector. The dimensional attributes obtained are converted into a binary scale and then processed by multivariate analysis of interdependent multidimensional scaling (MDS) which is then followed by a rotation process. Root Mean Square (RMS) on the X ordination axis will determine the level of sensitivity. On the X axis, it will determine the good and bad values. The highest RMS score on the attributes analyzed indicates the attributes that play a role in program sustainability ([Ngang & Sam, 2015](#)). In another dimension, the Y axis has a role to maintain the normality of ordination. Significant differences are shown by using Monte Carlo simulation.

The Monte Carlo analysis consisted of MDS ([Rahardjanto & Susilowati, 2018](#)) that can be used to analyze the effect of errors from the process carried out. With a confidence level of 95% at the analysis stage, it will be known the differences between the results of MDS and the Monte Carlo. These results indicate that the program sustainability will run well with a confidence level of 95%. Conversely, a large difference value indicates that sustainability is not going well. The value of stress determination and the value of the coefficient of determination (R²) is used to reflect the accuracy of the study dimension. This value shows the goodness of Fit function of the addition of attributes or in the MDS analysis. The value (R²) obtained is close to 1 indicating that the program sustainability status is good and the stress value is less than 0,25 (S<0,25)

3. Result and Discussion

Thru the LSLC program, the students will study together with the teachers who work professionally and develop the learning models ([Hakim, 2017; Herliani & Masitah, 2018; Rejeki et al., 2018; Saito & Atencio, 2015; Setyawan et al., 2019; Yono et al., 2019](#)). However, through the LSLC, the responsibility for students' education is not only delegated to the teachers in schools, but also involve the parents and other stakeholders in the development of education in schools ([Rahardjanto et al., 2019](#)). This shared responsibility in the field of education will encourage collaborative education in schools between the teachers and students, the teachers and other teachers, the teachers with stakeholders outside of school, as well as building up a good cooperation between one student and another in overcoming the learning problems. In brief, the Lesson Study processes of class in the school can be illustrated as the Figure 1.

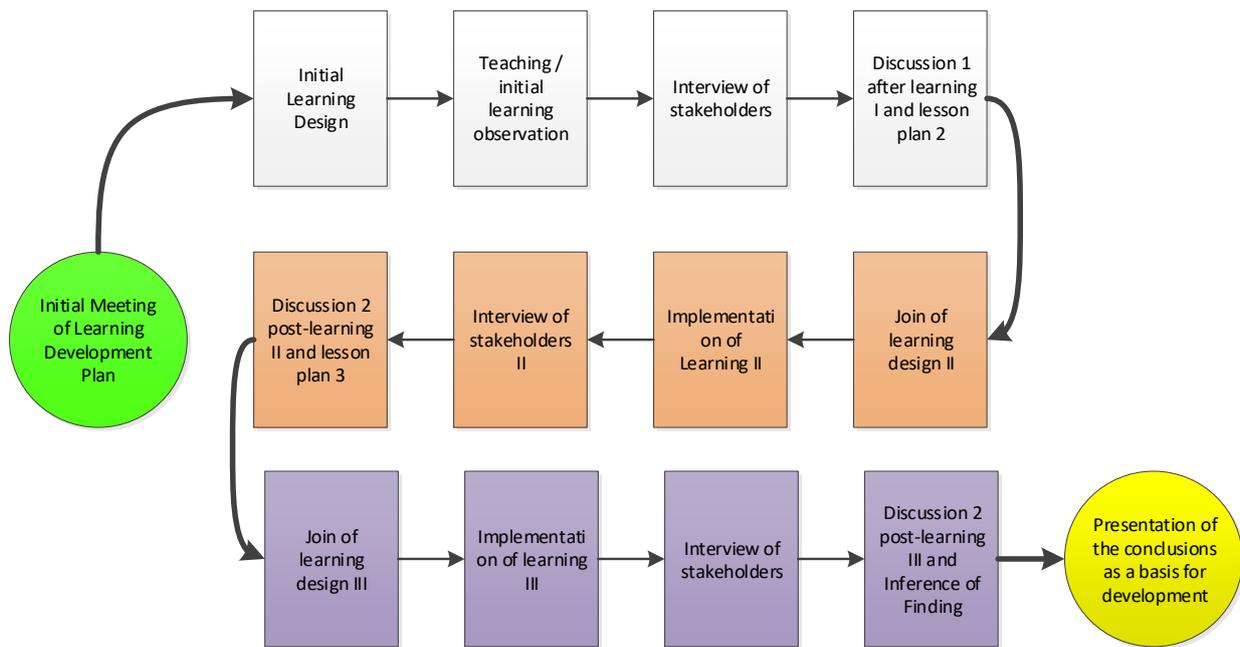


Figure 1. Lesson Study-based Learning Process

The description of the lesson study process above requires a professional action, as stated by [Fernandez \(2002\)](#), it is related to the learning process carried out in class. Curricular reform from a top-down model to a bottom-up model must be a fundamental paradigm shift for educators in schools. Education carried out in the school is expected to be an education which is closely related to the daily life of students ([Tan et al., 2019](#)); thus, the students can directly practice the learning outcomes in school on the development of life inquiry, culture, and critical thinking patterns in overcoming the problems.

The analysis of MDS in 5 dimensions that developed as a reference for the sustainability of LSLC program indicates that 3 dimensions are in a good category, while 2 dimensions show unfavorable results (Table 1). The highest value is in the pedagogic dimension; in which it is 77.2. Then, it is followed by the competence dimension with a value of 76.6, and the commitment dimension of 68.7. Furthermore, the subsidy dimension and socio-cultural show unfavorable numbers of 45.7 and 40.9. In the subsidy dimension and socio-cultural side, the program carried out has a smaller value when compared to the acquisition of other dimensions.

Table 1. The calculating results of Multidimensional Scaling on the 5 Dimensions of Lesson Study

Dimension	Sustainability Index		Difference	Statistics		Iteration
	MDS	Monte Carlo		Stress	R2	
Pedagogic	77.2	77.3	0.01	0.15	0.96	2
Competence	76.6	76.9	0.03	0.15	0.95	2
Socio-cultural	40.9	40.9	0.04	0.14	0.95	2
Commitment	68.7	68.9	0.02	0.14	0.95	2
Subsidy	45.7	45.9	0.02	0.14	0.95	2

Generally, by implementing the Lesson Study in school, the students' cognitive ability can be very well developed (84.6%) based on the respondents' opinions. Meanwhile, the affective and psychomotor abilities are almost balanced, in which those are 42.3% and 49.3%. In general, using lesson study can improve pedagogical skills ([Veloo et al., 2013](#)) in class by 77.2%. The success of the program is as illustrated in the following kite diagram (Figure 2).

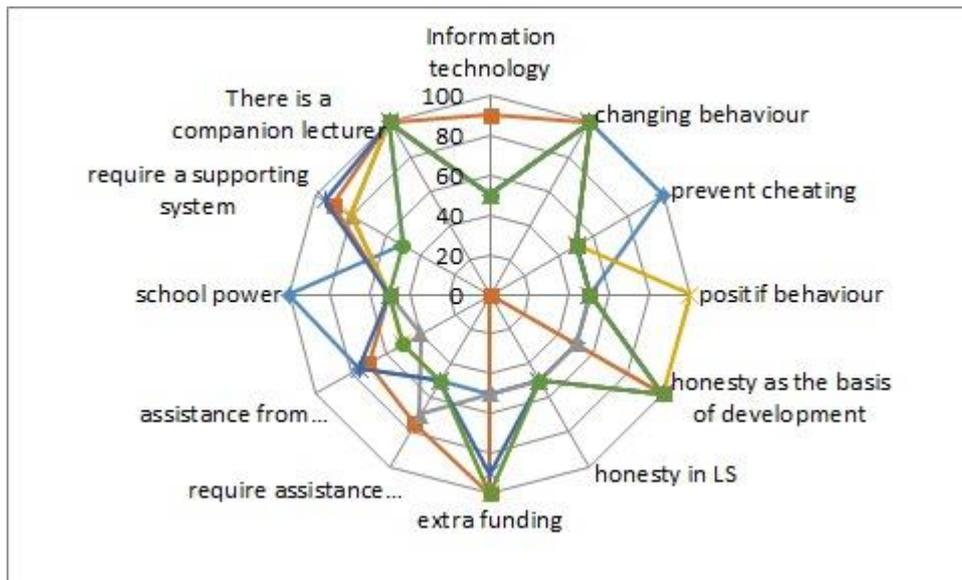


Figure 2. Kite diagram of LSLC program in Batu city

The activities carried out collaboratively between schools and various stakeholders had shown that they can strengthen the schools. This is reinforced by Galini et al (2014) who assert that the cooperation of stakeholders in the world of education is needed to develop the school. Yet, there are quite a lot of elements needed by the school to support the sustainability of LSLC activities in Batu City. The high extra costs, assistance from the educational support agencies, assistance from the local government (PEMDA) institutions, assistance from the energy sources of universities had put the value in the subsidy dimension of 45.7%

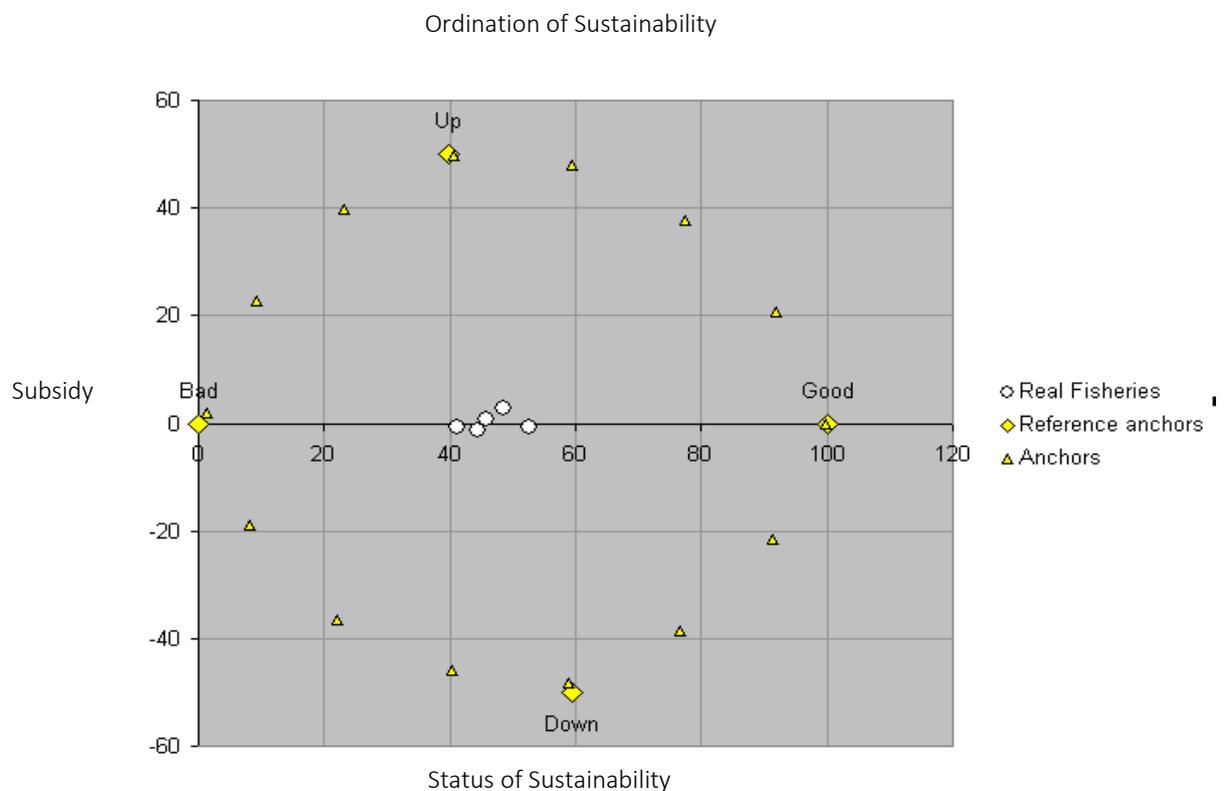


Figure 3. The ordination of sustainability of lesson study

The subsidy position of 45,7% indicates that the LSLC activities in Batu City still need an external energy assistance to implement the LSLC program in schools. The subsidy is a part of activities that cannot be separated from all schools. Consequently, the implementation of the LSLC program for some time still requires support from a supporting system such as technology (hardware, software, and brain ware), funds, and networking. According to C. S. Lim et al (2018) attention to this is very necessary, because it is related to the issue of sustainability, and analyzed the possible challenges and constraints faced in an effort to sustain the lesson study practice. This is widely experienced in various countries. Studies for sustainability are also in line with the keyword in LS, namely "continuous improvement" (Babcock et al., 2011; Hunter & Back, 2011). However, in LS the collaboration and networking aspects are the main things (Holmqvist, 2020; Lomibao, 2016; Stokes et al., 2020; Takahashi, 2014; Takahashi & McDougal, 2016). Especially for networking, Nurwidodo et al (2018) recommends the following "In order for LSLC to manifest and become successful, resourcing and utilizing the partnership with schools are required. Networking with partner schools can be implemented and can function well when the management of this networking conforms to shared needs, nurtures cooperation and mutual respect, gives and takes equally, and also promotes fair acceptance, support, independence, and discipline". This recommendation is interesting to implement, as an effort towards the sustainability of LSLC, in Indonesia and specifically in Batu City.

Funding and technology adoption also plays an important role in the sustainability of learning. If this idea is taken into account, it will very likely provide an opportunity to solve problems and encourage creativity in organizers, an important point in determining education policy (Hird et al., 2014; Mardhia et al., 2013). On the other hand, LS which originated in Japan and has become popular all over the world (Grimsæth & Hallås, 2015), which later developed into LSLC, has been adopted in different socio-cultures and educational contexts (Murata & Lee, 2020). LSLC demands a reform of school culture, which is needed to change the level of learning among children, teachers, and even parents. LSLC is a comprehensive vision and framework for school reform and needs to be applied holistically across disciplines (Saito et al., 2015). Therefore, it is very important to strengthen the socio-cultural dimension in LSLC. LSLC aims to locate all the stakeholders and resources of the education system differently. People, resources, concepts and materials are seen as interrelated and inform one another to maximize learning in schools - for children, teachers and the local community. Schools seek to build society in meaningful and equitable ways - that is, they learn how to live, and learn, with other compassionate people (Saito & Atencio, 2015).

4. Conclusion

The implementation of LSLC program in Batu City is a very effective activity in schools, in which it can develop three realms, namely cognitive, affective, and psychomotor of students. The activities carried out have positive impacts on the pedagogic, competence, Socio-cultural, and commitment dimensions. These four dimensions are a fundamental paradigm shift in the learning process carried out in schools. However, the sustainability of LSLC activities in Batu City has a weak point on the subsidy dimension. In this dimension, special attention is needed so that the LSLC program can continue to run, even though the subsidies from the government or parties outside the LSLC implementing agency are eliminated. Therefore, further studies can also be focused on this area so that an appropriate model or solution can be found to ensure the sustainability of the LSLC program.

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