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Lost in adaptation? Issues of adapting Japanese lesson study in non-Japanese contexts

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1 Abstract

The phenomenal spread of Japanese lesson study (LS) beyond Japan is indicative of the perception that the seemingly obvious routines of LS are transferable into foreign contexts. It is, however, to be expected, that various aspects of LS would be adapted to suit the culture of the adopting context. The diverse ways in which LS is adapted across different contexts provides the opportunity for researchers to unpack what needs to be done to better adapt, implement and sustain LS to support teacher development across non-Japanese contexts. This paper is based on the findings from a nation-wide research project undertaken to explore the adaptations made to LS in Singapore schools. Surveys and case studies provided data to examine LS structure and implementation processes in Singapore schools and to investigate school leaders' and teachers' experiences and understandings of LS processes. In teasing out the subtle differences among the Singaporean adaptations and Japanese LS, we gleaned a deeper understanding of the cultural and contextual factors that elucidate key features of LS that are pertinent in creating the necessary conditions for effective teacher learning.

Keywords Lesson study · Teacher professional development · Teacher learning · Implementation

17 1 Introduction

This paper is based on a research project undertaken by the authors to explore the variety in lesson study (LS) implementation in Singapore schools. The aim of the research was to examine the critical features in Singapore's varied approaches to LS and how they support or impede teacher professional development. This paper discusses one of the key findings from the research which suggested the impact of sociocultural implications on the implementation of Japanese LS (*jugyoukenkyuu*) in a non-Japanese context.

Within the body of research on teacher professional development, *jugyoukenkyuu* is widely acknowledged for its effective engagement of teachers as active learners in the process of

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26 becoming reflective professionals (Huang and Shimizu 2016; Stigler and Hiebert 1999). As
 27 such, LS has attracted the attention of governments, spreading nation-wide (Dudley 2013;
 28 Author), state-wide (Akiba and Wilkinson 2016) and province-wide (Saito et al. 2008). The
 29 widespread adoption of *jogyoukenkyuu* in educational contexts beyond Japan is indicative of
 30 the perception that the seemingly obvious routines of LS are transferable into foreign contexts
 31 (Phillips and Ochs 2003). Several writers, however, have cautioned that, as *jogyoukenkyuu* is
 32 a sociocultural teacher practice that has been ongoing for over a 100 years (Fujii 2014), there
 33 are aspects of LS that are “organic” to the Japanese education culture (Groves et al. 2016;
 34 Takahashi and McDougal 2016; Warwick et al. 2016). Some of its underlying assumptions
 35 and practices, therefore, may not be replicable in other countries, and uncritically transferring
 36 *jogyoukenkyuu* into a non-Japanese context may turn out to be problematic (Yoshida 2012).
 37 While it is expected that LS would be adapted to suit the norms, beliefs and systems of
 38 different cultures and contexts, there is concern that varieties of adaptations of LS run the
 39 risk of “diluting” the essence of *jogyoukenkyuu*, and in the process, its effectiveness in
 40 promoting teacher professional development is mitigated.

41 Studying the diverse ways in which *jogyoukenkyuu* is implemented across different edu-
 42 cation contexts provides the opportunity for researchers to unpack the critical elements of
 43 *jogyoukenkyuu* that effectively bring about teacher professional development (Stigler and
 44 Hiebert 2016). In turn, this may shed light on what needs to be done to better adapt, implement
 45 and sustain LS to support improvements in teacher learning across non-Japanese contexts
 46 (Akiba and Wilkinson 2016; Lee Bae et al. 2016). Furthermore, the comparison between the
 47 critical features of *jogyoukenkyuu* and the adaptation of LS could act as a mirror revealing the
 48 subliminal cultural values of the adopting context. Finally, the lessons gleaned from studying
 49 the case of a non-Japanese context adopting and adapting LS could inform research on the
 50 larger context of translation and implementation issues of cross-national policy borrowing
 51 in education (Seddon et al. 2013; Steiner-Khamsi 2014).

52 The aim of this article is to contribute to this area of literature by presenting a nation-wide
 53 study that explored the variations made to LS as a result of “importing” it into another nation’s
 54 (Singapore) education context. The research questions guiding this article were:

- 55 1. How have Singaporean schools adapted *jogyoukenkyuu*?
- 56 2. Why have these adaptations been made?
- 57 3. To what extent is the adapted version of LS effective for teacher professional develop-
 58 ment?

59 2 The Singapore context

60 A raft of educational reforms since 1997 has encouraged teachers to explore new approaches
 61 that go beyond traditional views of academic learning and achievement (Author et al. 2016).
 62 Not surprisingly, Singapore’s Ministry of Education (MOE) turned to teacher professional
 63 development as a key driver to operationalize its recent reforms (Hairon and Dimmock 2012).

64 In 2009, MOE launched the PLC (professional learning communities) initiative to support
 65 teachers to reach a higher level of professional competence and standing (Hairon and Dim-
 66 mock 2012; MOE 2009). MOE supported the PLC initiative by mandating that time should
 67 be set aside each week as part of the teachers’ work hours and “protected” exclusively for
 68 teacher professional learning. MOE suggested three “tools” school-based PLCs could use
 69 during this “protected time” of professional learning—action research, learning circles and
 70 lesson study. Lim et al. (2011) observed that such endorsement by MOE for LS contributed

71 to a spike in the number of schools adopting LS by 2010. In an informal, online poll of all the
72 principals in Singapore schools, 112 (31%) schools implemented LS in 2010 in comparison
73 with 59 schools in 2009 (Author).

74 **2.1 Critical features of *Jugyoukenkyuu* that lead to teacher professional learning**

75 To describe the critical elements of *jugyoukenkyuu*, this paper drew upon the literature by
76 writers who have intimate knowledge of LS and who have written extensively about LS. We
77 have also included in this section, the literature that described the implementation of LS in
78 contexts outside of Japan, and the variety of adaptations in how LS has been conceptualized
79 and organized in some non-Japanese contexts.

80 The literature on *jugyoukenkyuu* agrees that school-based *jugyoukenkyuu* is the most com-
81 monly practiced form of LS in Japan. Fujii (2016) described a typical year-long school-based
82 LS cycle in five steps depicting the activities undertaken by teachers. The steps are: (1) goal
83 setting; (2) lesson planning; (3) research lesson; (4) post-lesson discussion; and (5) reflection.
84 This concurs with the four-step cycle described by Perry and Lewis (2009) and Fernandez
85 and Yoshida (2004). The literature also concurs that the critical aspects that make *jugy-
86 oukenkyuu* effective for teacher professional development go beyond this structure. Yoshida
87 (2012) reminded that the “important purpose of conducting lesson study is to help teachers
88 become life-long learners through developing and participating in a (professional learning
89 community)” (p. 143). Implicit in this structure are two concepts of teacher learning—socio-
90 constructivistic learning as a community, and teacher learning through research.

91 **2.2 Socio-constructivist learning as a community**

92 *Jugyoukenkyuu* provides the socio-constructivistic process by which Japanese teachers
93 become knowledgeable skillful and develop their identities as members of the teaching
94 professional community (Doig and Groves 2011; Saito and Atencio 2013). Two features
95 highlight the socio-constructivistic nature of teacher learning in *jugyoukenkyuu*: participa-
96 tion in the community of practice, and sustained and long-term commitment to studying a
97 shared goal.

98 What makes *jugyoukenkyuu* effective for teacher professional learning is that the entire
99 school community makes joint sense of student learning by observing an attempt to address
100 a shared problem. For this to happen, all professional staff are involved in observing the
101 research lesson and attending the post-lesson discussion (Fujii 2016). This has organizational
102 implications, such as independent study by pupils, or closing school early for the day. Doig
103 and Groves (2011) observed that such an arrangement is seen to be a major constraint in
104 Australia, as “most schools would need to employ casual teachers to take the place of teachers
105 observing lessons in other classes” (p. 89). To avoid such an organizational inconvenience,
106 LS in many non-Japanese contexts tends to be confined to a small group of teachers focusing
107 on specific subjects rather than school-wide (Groves et al. 2016; Takahashi and McDougal
108 2016). Yet, in doing so, the essence of learning as a community of practice is lost.

109 As Fujii (2014) explains, at the end of the academic year in Japan, the entire school takes
110 stock of how they are progressing in addressing the research theme, and how they could move
111 on with the school-wide LS for the next school year. As the research theme is identified by
112 the teachers themselves, there is a sense of ownership and motivation to investigate ways to
113 address the problem. As the problem pervades across all grade levels, teachers see how they
114 can benefit by observing and evaluating the research lesson with students older or younger

115 than their own. Finally, the research theme maintains the focus of their research journey in
 116 meeting the school's overarching school-wide LS goal over several years (Fernandez and
 117 Yoshida 2004), allowing the school to chart its progress in moving closer to attaining its
 118 goal. Since all teachers in the school share the school's research focus, their professional
 119 interactions allow each member of the community—whether novices or experienced—to
 120 “make relevant contributions, receive both support and appropriately phrased challenge from
 121 their peers and work towards agreed adaptations to their future pedagogical approach” (War-
 122 wick et al. 2016, p. 566). Such professional collaborative discourse may be a challenge in
 123 non-Japanese contexts where collegiality extends beyond professional responsibilities and
 124 relationships among teachers are much more intense and personal. Ironically, in such cultures
 125 observed by Ebaegu and Stephens (2014) and Kusanagi (2014), where the relationships
 126 among teachers are intensely collectivistic, teachers are afraid to speak up for fear of hurting
 127 others, particularly novice teachers in the presence of a superior.

128 A key member of the learning community of *jogyoukenkyuu* is the “outside specialist”
 129 (Chokshi and Fernandez 2004). As the external specialists are usually retired principals and
 130 teacher educators who would have observed in hundreds of lesson studies, they are able to
 131 give suggestions and comments drawing from their vast experiences of observing in other
 132 schools (Takahashi 2014). External specialists are therefore critical in extending the socio-
 133 constructivistic learning to the wider community of teaching practice beyond the confines
 134 of the school. Such opportunities to work closely with pedagogical and content experts are,
 135 however, not easily available to teachers in Singapore (Author et al. 2011) and the United
 136 States (Akiba and Wilkinson 2016; Yoshida 2012).

137 2.3 Teacher learning through research

138 The research element of *jogyoukenkyuu* centers on conducting “classroom experiments”
 139 (Fernandez 2002) which are called “research lessons” (RLs). The LS activities around the
 140 RL—planning, observing and discussions after the RL—are carried out in ways that involve
 141 research skills. These skills include careful investigation of the problem so as to design the
 142 plan for the RL that will enable gathering of data, and analysis and interpretation of findings to
 143 shed light on the problem. Two features are critical in the *jogyoukenkyuu* planning meetings:
 144 the lesson plan and the intensive study of the curriculum (*kyozaikenkyuu*).

145 The lesson plan is a crucial document that is the basis of the planning discussions (Fujii
 146 2016; Watanabe 2002). The bulk of the plan is a detailed introduction which shows the
 147 appropriateness of the task in addressing the research theme and the learning goals by situating
 148 the RL in its context. Detailed background information is given, including a description of the
 149 students, and information about the scope and sequence of the curriculum across grade levels
 150 (Fernandez and Yoshida 2004; Takahashi and McDougal 2016; Watanabe et al. 2008). To
 151 produce such a substantial lesson plan, intensive study (*kenkyuu*) of the curriculum (*kyozai*)
 152 is needed. In non-Japanese contexts, however, Doig and Groves (2011) observed “the lack
 153 of opportunity for and disposition towards detailed study of mathematical content in many
 154 countries, including Australia” (p. 81). They noticed that non-Japanese participants at an
 155 international conference “had little in-depth knowledge relating to the content of the lesson...
 156 or experience in studying teaching materials in depth” (p. 81). Fujii (2014) observed in Africa
 157 that when a teacher had not studied “thoroughly the instructional materials beforehand,” or if
 158 “he did not know the scope and sequence of the curriculum well enough,” or “was unfamiliar
 159 with the students’ prior knowledge,” he was unable to “anticipate many of the responses from
 160 the students” (p. 74).

161 Another cluster of research skills practiced in *jogyoukenkyuu* is the gathering of data, and
 162 analysis and interpretation of findings to shed light on the problem. This is done through
 163 observing in an RL (Fernandez et al. 2003). Japanese observers collect their data by writing
 164 detailed and copious notes about the students' solution strategies that make visible their think-
 165 ing and learning (Doig and Groves 2011). This is necessary as during the post-RL discussions,
 166 the observers do not speak impressionistically about the quality of the lesson, but engage
 167 in productive dialogic interactions such as "requesting information, giving reasons, (and)
 168 providing evidence" (Warwick et al. 2016, p. 566) by talking specifically about the student
 169 work and conversations they recorded. Akiba and Wilkinson (2016) lament that "previous
 170 case studies of US teachers' practice of lesson study have shown the difficulty of adopting
 171 and maintaining the researcher lens" as "the shift from a traditional role of teachers who
 172 utilize externally generated knowledge to the new role of generating professional knowledge
 173 to inform their practice requires capacity building of teachers through ample resources and
 174 leadership support" (pp. 76, 77).

175 An integral part of the research stance is critical self-reflection (*hansei*), that is deeply
 176 ingrained and highly valued in the Japanese culture (Doig and Groves 2011; Lewis et al. 2006;
 177 Lewis and Takahashi 2013). Teachers who practice *hansei* formulate valid questions about
 178 their own practice and then find ways to seek data that will answer these questions (Rock
 179 and Wilson 2005). This highlights that Japanese teachers try to focus on broader principles
 180 that would have implications for teaching beyond a single lesson (Fernandez et al. 2003).

181 3 Research design and methods

182 In this paper, we report on a research project undertaken by the authors to explore the
 183 variety in LS implementation in Singapore schools. The research team conducted nation-
 184 wide surveys and in-depth case studies of four schools to investigate school leaders' and
 185 teachers' experiences and understandings of LS processes.

186 3.1 Surveys

187 The survey method was chosen to get a broad sweep overview of the perceptions of school
 188 leaders and teachers about LS. Three survey questionnaires were sent out. The first survey was
 189 carried out online, addressed to all the 363 school principals across the nation. It garnered a
 190 response from 329 (90.63%) principals. The questions were aimed at investigating principals'
 191 objectives for involving the school in LS and their evaluation as to whether these objectives
 192 have been met through the implementation of LS. We also wanted to find out if the school
 193 leaders would continue implementing LS in their schools. One hundred and ninety (57.8%)
 194 of the 329 principals who responded replied that their schools were implementing LS in 2014.
 195 Over 90% of schools doing LS indicated that they would continue with the approach. About
 196 18.6% of schools not doing LS in 2014 indicated that they would adopt LS in the future, and
 197 over 60% of schools not doing LS in 2014 may adopt LS in the future (Table 1).

198 The second survey focused on the lesson study activities in 50 schools that had indicated
 199 that they were carrying out LS in 2014 (based on the responses from the online principal
 200 survey). Through this questionnaire, we hoped to collect a comprehensive picture of the
 201 way LS was implemented in the school. We also aimed at finding out how the schools had
 202 adapted the LS process. This survey was completed by the "key personnel" who oversaw the

Table 1 LS implementation in schools and plans to continue with LS

Response to online principals' survey	No. of schools (<i>n</i> = 363)			
	Primary	Secondary	Jr College	Total
Surveyed	183	155	25	363
Responded	166 (90.7%)	140 (90.3%)	23 (92%)	329 (90.6%)
Schools doing LS in 2014	99 (59.6%)	79 (56.4%)	12 (52.2%)	190 (57.8%)
Intending to continue LS beyond 2014	96.55%	93.06%	100%	
Schools not doing LS in 2014	67	61	11	139
Intending to implement LS in future	10.4%	8.2%	0%	
May implement LS in future	64.2%	65.6%	63.6%	
Not implementing LS in future	25.4%	26.2%	36.4%	

203 implementation of LS in the school. They tended to be the School Staff Developer (SSD) or
 204 Vice-Principal.

205 The third questionnaire was sent to the teachers who were involved in LS in the 50 schools
 206 that had indicated that they were carrying out LS in 2014. The aim of this questionnaire was
 207 to ascertain the teachers' perceptions toward the different aspects of LS, i.e., the planning
 208 meetings, the observation in the research lessons, the post-research lesson discussions, and
 209 the involvement of an external resource person. We also wanted to find out what support
 210 teachers would like for the facilitation of the implementation of LS. Four hundred and sixty-
 211 six teachers from 48 (96%) of the 50 schools approached submitted responses to the survey.

212 3.2 Case studies

213 To gather thick descriptions of how schools carried out LS, we carried out interpretive case
 214 studies of four schools that were early adopters of LS. The in-depth case studies involved
 215 observations of LS activities throughout the academic year. The researchers played the role of
 216 non-participant observers in the LS teams, observing at least one team carry out an LS cycle.
 217 Typically, a cycle of LS involved approximately 5–8 meetings, one or two research lessons
 218 (RLs), and one or two meetings after the RL. The meetings and RLs were audio-recorded.
 219 The case researcher also kept a record of the minutes of the meetings, and other documents
 220 (e.g., reflection journals) teachers produced or used during the LS cycle. Altogether, the
 221 researchers completed 72 observations in the four schools.

222 Interviews with school leaders and teachers were also conducted. Each semi-structured
 223 interview lasted approximately 1 h, with a pre-planned interview protocol to provide prompts
 224 for the interviews. The teachers also completed the teacher survey mentioned above.

225 The choice of schools for the case studies was purposive as we targeted variations of LS
 226 in different contexts. Table 2 details how each school presented a specific context in which
 227 the team was interested to study. We used pseudonyms for the four case studies to protect
 228 the anonymity of the participating schools.

229 Fillmore Primary had been carrying out LS since 2004. One of the teachers had learnt
 230 about LS at a conference and expressed his interest to the principal to try out LS in the school.
 231 With the principal's support, a team of teachers went to Japan to find out more about LS. After
 232 the principal retired, within a space of 2 years, the school saw three changes of leadership.
 233 During that time, one of the principals even stopped the practice of LS. In the year of this

Table 2 Context of case study schools

School	Key variations in context	Reasons why the school was chosen for study
Fillmore primary	Primary school; initiated by a teacher to study pedagogical innovations to improve student achievement	To find out: to what extent the school was carrying out LS (since its implementation of LS in 2004) if there have been any adaptations to LS to ensure sustainability of LS
Elliot secondary	Secondary school; initiated by the Principal to build a “unitary culture for the school”	To find out: how teachers felt about doing LS (since it was introduced by the Principal) if there have been any adaptations to LS to ensure teacher engagement
Grange secondary	Secondary school; hosted several LS public lessons in mathematics	To find out: to what extent the other departments were carrying out LS if there have been any adaptations to LS to ensure relevance to the respective subjects
Dewey secondary	Secondary school; carried out lesson study for learning community (LSLC)	To find out: to what extent the school was doing LSLC (vis-à-vis LS) if there have been any adaptations to LSLC

study, there were 12 LS teams for subjects such as Mathematics, English Language, Chinese Language, Malay Language, Tamil Language, Science and Physical Education.

The principal of Elliot Secondary School had the task of merging two schools. She felt that LS would help “unite the staff of the two schools.” LS was carried out by the professional learning teams (PLT). In the year of this study, there were 14 professional learning teams (PLTs) in the school, with eight of them using the LS approach. During the period of this study, LS seemed to be thriving in Elliot Secondary, with 45% of the 40 teachers surveyed strongly agreeing that LS gave them the opportunity to learn from colleagues. There was also strong endorsement (22% strongly agreed; 75% agreed) that LS was a productive use of their time. At the time of writing of this article (3 years after the research), however, the researchers heard that when the principal retired and a new principal took over, the school stopped doing LS.

A group of mathematics teachers in Grange Secondary School started LS since 2008. The school participated actively in LS activities organized by the National Institute of Education (NIE), such as attending workshops on LS and hosting several public lessons on Mathematics by Dr. Akihiko Takahashi. During the year of the research, there were 15 LS teams by subjects including mathematics, mother tongue, humanities and science. During the period of this study, LS seemed to be thriving in Grange Secondary, with 40.5% of the 42 teachers surveyed strongly agreeing that LS gave them the opportunity to learn from colleagues. They also found LS useful for their instruction, as 26.2% of the teachers strongly agree, and 73.8% agreed that LS activities raised ideas that influenced their teaching.

Dewey Secondary School tried out a particular variation of lesson study called Lesson Study for Learning Community (LSLC). The Principal had consulted an LSLC expert and agreed to focus on the students who were academically challenged, rather than discussion

around subject curricula. This emphasis on generic student behavior rather than on subject matter knowledge, however, did not receive widespread acceptance among teachers and the heads of departments. Eventually, during the period of this research, we observed that the school had moved away from the LSLC model, to a subject-based approach.

4 Findings

The findings from the surveys and the in-depth case studies of the four schools have been synthesized to address the first two research questions for this article: how have Singaporean schools adapted *jugyoukenkyuu*; and why have these adaptations been made?

4.1 Adaptations to purpose for doing LS and the concept of school-wide LS

The healthy response from principals as seen in the intention to continue the practice of LS (Table 1) reflects a conviction of school leaders that LS is beneficial to the school. To find out what their objectives were for involving their schools in LS, the principals were asked to rank eight statements (please refer to “Appendix” section) according to their priority. Table 3 shows the top four objectives according to the top 3 priorities.

It is notable that only 16.03% of the principals felt that the first priority for implementing LS is to deliberate on school mission and goals. As the literature on *jugyoukenkyuu* revealed, the purpose of carrying out LS is to take stock of how they are progressing in addressing the research theme which addresses the school’s mission and goals (see Sect. 2.1). From our in-depth case studies of four schools, we noticed that only one school (Fillmore Primary) had a school-wide research theme (“Use of assessment for learning to operationalize the growth mindset”). Even then, the research theme was identified by the SSD and not collectively identified through consensus by the entire school. The LS team we observed did not refer to the research theme during their deliberations and reflections, and the links between assessment for learning, the growth mindset and solving of one-step multiplication problem sums were not discussed.

Table 3 shows that uppermost on the minds of school leaders is the focus on students’ learning and outcomes. 31% of the principals reported that their first priority lay in the focus on student learning and outcome. It was for this very reason that the teachers at Fillmore Primary started doing LS, as one of the teachers explained, “we were looking at LS (to help us see) how to make lessons interesting (so that) our (students’) results would improve.” Such a focus on students’ learning and outcomes leads to viewing the LS process as experiments

Table 3 Principals’ objectives for implementing LS

What do principals hope to achieve from implementing LS?	First priority (%)	Second priority (%)	Third priority (%)
To focus on student learning and outcome	31.06	24.22	18.01
To enhance teachers’ pedagogical content knowledge	19.11	26.75	28.03
To support school-based curriculum innovation	16.25	21.25	16.88
To deliberate on school mission and goals	16.03	3.85	3.21

in trying out new teaching strategies. This could explain why the improvement of teachers' pedagogical content knowledge was the next objective (19.11%) that was ranked as first priority. The case researchers for all four case schools in this study agreed that the LS teams we observed tended to see LS as one-off projects on planning research lessons to try out new teaching approaches, the effectiveness of which was measured by improvements in students' posttest scores.

The case of Dewey Secondary School is an example where the objective for implementing the LSLC version did not resonate with the teachers. The LSLC version emphasizes lesson observations to focus on student response rather than on lesson planning that focus on the subject content. The first trial of LSLC in 2010 did not receive widespread acceptance among teachers and department heads. They felt that time was needed to strengthen the knowledge of the teachers in their departments with regard to understanding the changes in syllabi for their specific subjects. As a result, the principal allowed LS work to become more subject focused, moving away from the emphasis of LSLC.

4.2 Adaptations to the process of learning through research

Unique to the Singapore context is the infrastructural support given by MOE to the implementation of professional learning communities (PLCs). Time for meeting is worked into teachers' official work hours. Yet, when asked to rank the type of support they require to carry out LS, 50.5% of the 466 teachers who responded to our survey ranked more support from school leaders in structuring LS in their curriculum time as the highest need (first place). Despite having this time "protected" to carry out LS processes, teachers still ranked "having structured LS time" as the highest need.

The question raised is, how much time is enough? A teacher explained that "the scheduled time was not enough and we had to schedule more meetings. Getting all team members at the same time was not easy at all." The findings from the nationwide teacher survey (Table 4) showed that the feature that garnered most dislike from the 466 teachers was planning meetings. The reasons for dislike ranged from "time consuming" (nine times), to "meetings could be lengthy if not focused" (six times). The question of sufficiency of time begs another question: what happens during that time?

Table 4 Features of LS that the teachers liked or disliked

LS feature	Strongly like (%)	Like (%)	Dislike (%)	Strongly dislike (%)	NA (%)
Planning meetings	6.9	73.4	15.1	0.2	4.3
Teaching RL	6.8	65.4	11	–	16.9
Observing RL	15.7	75.2	4.8	–	4.3
Post-RL discussion	15	76.9	4.1	–	3.9
Watching video of RL	7.9	49.3	14.3	0.2	28.3
External resource person	10	47.1	5.5	0.2	37.1

321 At Elliot Secondary, the researcher observed that though the school had set aside the
 322 first period (7.30 to 8.10 am) on Thursday morning for PLT meetings, it was barely enough
 323 for deep conversations. In five out of the eight PLT meetings observed, the teachers' con-
 324 versations were interrupted by the pre-assembly music, with the teachers expressing stress
 325 in not having completed the task that they had set for the meeting. Though seven meet-
 326 ings were set aside as planning meetings for the LS, the teachers did not discuss the lesson
 327 plan for the RL at all. Two meetings were spent discussing the allocation of readings for
 328 the literature review. Five meetings were spent on scheduling and crafting the posttest and
 329 student survey. The lesson plan for the RL was crafted one evening during the school
 330 vacation, and was discussed in one session when the MOE external expert went through
 331 it 1 week before RL1 to suggest revisions. The lesson plan did not detail the position of
 332 the unit in the scope and sequence of the curriculum to make connections to prior and
 333 subsequent learning about the skills of reading comprehension. There was no evidence of
 334 anticipating likely correct and incorrect responses, particularly from slower or faster learn-
 335 ers.

336 It is notable that 15.7% of the teachers strongly liked observing the RL and 15% strongly
 337 liked the post-RL discussion. Despite this positive response, our case studies surfaced some
 338 challenges in how these activities are carried out. One of the challenges has to do with
 339 teacher capacity to carry out the LS process such as deep conversations around insights
 340 gleaned from observing students and depth of discussion during the post-RL colloquium.
 341 As the SSD of Elliot Secondary School lamented: "They don't spend a lot of time (talk-
 342 ing about an area of concern)... It is like... OK for this year's lesson study... there is a
 343 change in the syllabus so maybe this is an area (we will study)." This was supported by
 344 the observations of the English Language PLT which was trying out a new strategy (recip-
 345 rocal teaching) promoted by MOE. The aim of the lesson tended to focus on completion
 346 of the task, resulting in the students (and teachers) concentrating on getting the answer to
 347 the questions, rather than the thinking process and application to new contexts. During the
 348 RL, the researcher observed that none of the teacher observers made notes on the lesson
 349 plan. The focus of the post-RL1 discussion was on revising the teaching strategies in use
 350 of the resource (cue cards), rather than on the thinking or strategies that the students used
 351 to get to the answer. The problem with focusing on the teaching strategy was that it was
 352 highly teacher-dependent. It was about what she did and how she did it. It was also highly
 353 dependent on the context—the passage and the types of questions asked. The conversation
 354 tended to hover around the answers given by the students rather than focusing on what the
 355 students did to get to their answers, and what their answers indicated about their own thinking
 356 strategies, rather than the teacher's teaching strategies. From the researcher's observation of
 357 the meetings, RLs and post-RL discussions, the PLT observed in Elliot Secondary was an
 358 example of LS with a focus on refining a teaching strategy (reciprocal teaching for read-
 359 ing comprehension) or teaching resources (cue cards), rather than on research—that is, a
 360 search for a solution to a teaching–learning problem (in this case, how readers comprehend
 361 text).

362 At Dewey Secondary School, the researchers noted that some teams may not even
 363 make time for the post-RL colloquium. During an observation and reflection session,
 364 the LSLC expert noted with concern that the teachers' comments were not aligned with
 365 the goals of LSLC. In addition, the time for post-lesson discussion was too short—only
 366 20 min:

367 The way ... they (were) giving the comment was quite process-oriented ...
 368 They referred to some scenes, ... (focusing on) the way to teach. ... (This)

369 would be (giving) feedback, rather than sharing the learning... Feedback is to
 370 inform back to the teacher who opened the practice for the public, meaning
 371 that, I teach you about your shortcomings or problems... Sharing learning is
 372 based upon your own takeaways... ‘This is what I learnt... from observing your
 373 practices... This is what I have to be mindful about.’... so it is slight, small
 374 (difference), but significant because it generates a culture. It generates a culture
 375 of modesty, it generates a culture of mutual thanks, appreciation, and recogni-
 376 tion.

377 5 Discussion

378 In this section, we discuss the third research question for this article, to what
 379 extent is the adapted version of LS effective for teacher professional develop-
 380 ment?

381 As encapsulated by the Japanese proverb—“Beginning is easy; continuing is hard”—be-
 382 ginning a process such as educational change may be the easiest stage of the journey.
 383 Continuing the journey and staying the course of the change is the hardest part. The case
 384 of how Singapore schools implement and sustain LS exemplifies the complexity of the
 385 situation. It would seem that the structures are in place, with strong support from MOE
 386 mandating that time be structured into teachers’ work to carry out LS. Some MOE cur-
 387 riculum departments even used LS to promote teaching strategies, and MOE officers acted
 388 as external resource persons. As could be seen in Table 1, the school leaders were posi-
 389 tive about LS. Our findings, however, showed there are deeper issues that go beyond the
 390 form and structure of LS. As noted by a Head of Department (HOD) of one of the case
 391 schools:

392 If I look at it as entire school or level not everyone is equally enthusiastic about lesson
 393 study. ... So it will be good to actually see more teachers believing in the use of lesson
 394 study and really doing it. We are talking about transforming not reforming. Not just
 395 change the form but really doing it in the spirit of wanting to actually improve the craft
 396 of teaching and learning.

397 As described earlier, what makes *jogyoukenkyuu* effective for teacher professional devel-
 398 opment has to do with the two concepts of teacher learning that it embodies—socio-
 399 constructivistic learning as a community, and teacher learning through research. Our findings
 400 showed that the sociopolitical culture of the Singaporean context raises challenges to such
 401 a perspective of teacher learning, which then affect the spirit in which LS is carried out in
 402 Singapore.

403 It is well known that Singapore’s sociopolitical culture places a premium on achieve-
 404 ment in traditional high-stakes examinations (Gopinathan 2001; Author 2013; Ratnam-Lim
 405 and Tan 2015). It is therefore not surprising, as shown in Table 3 in our findings,
 406 that uppermost on the minds of school leaders is the focus on student outcomes. In
 407 the examination-oriented education system in Singapore, the bottom line that determines
 408 success in teaching and learning is improvement and positive change in the learning out-
 409 comes of students, particularly scores on high-stakes examinations and achievement tests.
 410 The focus of such an objective is on immediate results rather than long-term effects
 411 such as teacher professionalism. Hairon and Dimmock (2012) found that “the notion
 412 of PLCs and their influence is likely to be confined to pedagogical practices, subject

413 expertise and student learning” (p. 420). The effect of such a focus is that teachers
 414 tend to view what is worthy for them to study in LS are strategies to ensure that stu-
 415 dents are able to answer examination questions well. This was the underlying concern
 416 for the team we observed in Elliott Secondary, as they carried out pretests and posttests
 417 around the research lesson. To the team’s disappointment, the students did worse in the
 418 posttest.

419 Unlike the clarity of research stance among Japanese teachers in *jugyoukenkyuu*, Sin-
 420 gaporean teachers are unclear about how LS is a form of research to improve their
 421 own practice. As seen in the lament by the SSD of Elliot Secondary earlier, teachers
 422 did not know what to observe during the RLs, and what to discuss during the post-RL
 423 colloquia. The teachers in Dewey secondary talked about LS work as being a sepa-
 424 rate project apart from regular curriculum teaching. One teacher talked about how they
 425 had to pick a “sample” and do the “treatment process” which had to be carried out at
 426 a different time outside of regular class time. The language used by this teacher indi-
 427 cated that the action research she was engaging in was not aligned with what she is
 428 trying to do to prepare her “graduating class” for examinations. It is no wonder, then,
 429 that teachers perceive LS as “extra work.” This corroborates with the observation made
 430 by Hairon and Dimmock (2012) that “embedding PLCs in schools can mistakenly be
 431 seen as a process of bolting on yet more duties and tasks for teachers to perform”
 432 (p. 420).

433 While the research stance among Japanese teacher in *jugyoukenkyuu* focuses on what each
 434 teacher learns about improving practice with regard to student thinking and learning, or the
 435 curriculum, this study revealed that Singaporean teachers tended to view action research as
 436 testing new strategies for teaching with an eye to improving students’ examination results.
 437 This may explain why the teachers of Dewey Secondary preferred the teams to be subject-
 438 specific. It could also explain why the team in Elliot Secondary conducted pre- and posttests,
 439 and much of the discourse at the meetings centered on the strategy. Fujii (2014) observed a
 440 common misconception in non-Japanese LS that completing the task is the aim of the lesson,
 441 with teachers concerned only with whether students were able to get the answer to the task.
 442 This would only remain at the level of problem solving, guided by the question, “What is
 443 the best way to teach X?”, limiting the teacher learning to only understanding the task, or
 444 worse, chase after the elusive dream of a perfect lesson (Stigler and Hiebert 2016; Suzuki
 445 2012).

446 Lastly, there is the question of how to deepen the quality of socio-constructivistic
 447 learning by engaging every member of the teaching community. The case of Elliot Sec-
 448 ondary showed that when the aim for implementing LS is merely to encourage collegiality
 449 among staff, it is not convincing enough as an objective for sustaining the practice. In
 450 all the case schools we observed, there were several teams engaged in their own LS
 451 that were not unified by a collectively constructed research theme. As such, there were
 452 some teachers who did not find the LS work relevant to their own classes. One of
 453 the researchers observed that the team that she shadowed had engaged in work directly
 454 related to academically stronger classes. In all the case schools, we observed that the
 455 school leaders were not involved in the team meetings (partly because there were so
 456 many teams meeting concurrently) or even in observing the RLs and the post-RL collo-
 457 quia.

6 Conclusion

In comparison with *jugyoukenkyuu* which has been practiced in Japan since the nineteenth century (Saito and Atencio 2013), the practice of LS in Singapore schools is still at the infancy stage. While there is a lot of interest in LS, and support from MOE, there is concern that schools practicing LS may do so in a superficial manner and dilute the essential features that are capable of creating deep and enduring professional learning for teachers. As the LSLC expert who advised Dewey Secondary School noted, the adaptations to LS were seen as slight tweaks, such as meeting in subject groups; focusing on teaching strategies to ace the examinations; omitting anticipating the students' responses in planning the RL; and giving feedback to inform the RL teacher on how to teach better. These seemingly small differences, however, reflect a significant difference in the sociocultural orientation.

The implications for practice are that school leaders and teachers need to honestly examine their objectives for engaging in LS as a platform for their own PD and not include the "hidden agenda" of wanting to see dramatic change in student achievements in the examinations. Our experience of studying the implementation of LS in Singapore schools shows that while principals are generally convinced of the value of LS in nurturing teacher professional learning, there is the impression that it is something that the teachers have to do in their teams, and not embraced as a school-wide socio-constructivistic endeavor. As noted by Bolman and Deal (1991) in a study on Singaporean principals' perspectives for understanding leadership and management effectiveness, Singaporean principals tend to highly value structures (emphasizing efficiency and keeping their eye on the bottom line and holding people accountable for results) and facilitation of internal process ("adjusting people to fit the organization" through training and workshops) over creating coalitions and providing a shared sense of mission and identity.

Even as we are writing this article, MOE has announced major reforms in an effort to shift away from standardized testing and reducing the emphasis on academic grades, toward holistic education and cultivating the joy of learning in students. All the more, Singaporean teachers and school leaders need to shift their focus from simple question and answer, or finding the "best" way to teach the subject so that the students can ace the examination, to a focus on the more deeply reflective questions that *jugyoukenkyuu* asks. These questions include: Did the children learn what the teacher intended them to? Did the teacher teach what the children actually learned? What did the teacher learn from watching the children learn (Suzuki 2012)?

Till we learn to value the benefits of socio-constructivistic learning by the community of teaching practice, we will continue to miss out on the true spirit of LS and merely go through the motion of the different steps involved in the LS cycle.

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Some Questions in the Principal Survey

Are you implementing Lesson Study in your school?
 Do you plan to continue implementing LS in 2014 and beyond?
 When do you intend to implement LS in your school?
 What were the hindrances for not implementing LS before?
 What has prompted you to implement LS in your school now?
 What objectives do you intend to achieve through the implementation of LS? (Rank according to your priority, 1 being the highest and 8 being the lowest)
 To deliberate on school mission and goals
 To enhance teachers' pedagogical content knowledge
 To enhance teachers' subject matter knowledge
 To focus on student learning and outcome
 To help teachers in designing curriculum
 To help teachers to grow professionally
 To increase collegiality among teachers
 To support school-based curriculum innovation
 What percentage (approximately) of teachers are involved in LS?
 What is the scope/extent of LS in this school?
 What is your perception of the extent to which LS has helped your teachers?
 What support do you provide to your teachers in conducting LS in your school?
 What are the challenges you face in implementing LS in your school?

Some Questions in the Teacher Survey

Please indicate the extent to which you agree or disagree with each of the following statements about lesson study: Lesson Study...

Was a productive use of my time
 Is essential to my "being" as a teacher
 Enabled me to examine the curriculum more carefully
 Has helped me connect my daily classroom practices to long-term goals
 Contributed to my own knowledge in the subject
 Contributed to my own knowledge about teaching the subject
 Increased my understanding of students' learning processes in the subject
 Has made me less afraid about opening my lessons to others to observe
 Increased collegiality among colleagues
 Has made it easier for colleagues to visit each other's classrooms
 What did you like or dislike about LS? Please elaborate your answer to help us understand your response.
 The planning meetings
 Teaching research lesson(s)
 Observing research lesson(s)
 The post-research lesson discussion
 Watching videos of the research lessons
 The involvement of the external resource person(s)
 How can your school leaders support and facilitate your involvement in LS? Rank your selections from 1 being the most important and 6 being the least important

References

- 503 Akiba, M., & Wilkinson, B. (2016). Adopting an international innovation for teacher professional development:
504 State and district approaches to lesson study in Florida. *Journal of Teacher Education*, 67(1), 74–93.
- 505 Author 1 (XXXX).
506 Author 2 (XXXX).
507 Author 3 (XXXX).
508 Author 4 (XXXX).
- 509 Bolman, L. G., & Deal, T. E. (1991). Leadership and management effectiveness: A multi-frame, multi-sector
510 analysis. *Human Resource Management*, 30(4), 509–534.
- 511 Chokshi, S., & Fernandez, C. (2004). Challenges to importing Japanese lesson study: Concerns, misconcep-
512 tions, and nuances. *Phi Delta Kappan*, 85(7), 520–525.
- 513 Doig, B., & Groves, S. (2011). Japanese lesson study: Teacher professional development through communities
514 of inquiry. *Mathematics Teacher Education and Development*, 13(1), 77–93.
- 515 Dudley, P. (2013). Teacher learning in lesson study: What interaction-level discourse analysis revealed about
516 how teachers utilized imagination, tacit knowledge of teaching and fresh evidence of pupils learning, to
517 develop practice knowledge and so enhance their pupils' learning. *Teaching and Teacher Education*, 34,
518 107–121.
- 519 Ebaegu, M., & Stephens, M. (2014). Cultural challenges in adapting lesson study to a Philippines setting.
520 *Mathematics Teacher Education and Development*, 16(1), 43–64.
- 521 Fernandez, C. (2002). Learning from Japanese approaches to professional development: The case of lesson
522 study. *Journal of Teacher Education*, 53(5), 393–405.
- 523 Fernandez, C., Cannon, J., & Chokshi, S. (2003). A US-Japan lesson study collaboration reveals critical lenses
524 for examining practice. *Teaching and Teacher Education*, 19, 171–185.
- 525 Fernandez, C., & Yoshida, M. (2004). *Lesson study: A Japanese approach to improving mathematics teaching
526 and learning*. Mahwah: Lawrence Erlbaum Associates.
- 527 Fujii, T. (2014). Implementing Japanese lesson study in foreign countries: Misconceptions revealed. *Mathe-
528 matics Teacher Education and Development*, 16(1), 65–83.
- 529 Fujii, T. (2016). Designing and adapting tasks in lesson planning: A critical process of lesson study. *ZDM
530 Mathematics Education*, 48(4), 411–423.
- 531 Gopinathan, S. (2001). Globalisation, the state and education policy in Singapore. In J. Tan, S. Gopinathan,
532 & W. K. Ho (Eds.), *Challenges facing the Singapore education system today*. Singapore: Prentice Hall.
- 533 Groves, S., Doig, B., Vale, C., & Widjaja, W. (2016). Critical factors in the adaptation and implementation of
534 Japanese lesson study in the Australian context. *ZDM Mathematics Education*, 48(4), 501–512.
- 535 Hairon, S., & Dimmock, C. (2012). Singapore schools and professional learning communities: Teacher pro-
536 fessional development and school leadership in an Asian hierarchical system. *Educational Review*, 64(4),
537 405–424.
- 538 Huang, R., & Shimizu, Y. (2016). Improving teaching, developing teachers and teacher educators, and linking
539 theory and practice through lesson study in mathematics: An international perspective. *ZDM Mathematics
540 Education*, 48(4), 393–409.
- 541 Kusanagi, K. N. (2014). The bureaucratizing of lesson study: A Javanese case. *Mathematics Teacher Education
542 and Development*, 16(1), 84–103.
- 543 Lee Bae, C., Hayes, K. N., Seitz, J., O'Connor, D., & DiStefano, R. (2016). A coding tool for examining the
544 substance of teacher professional learning and change with example cases from middle school science
545 lesson study. *Teaching and Teacher Education*, 60, 164–178.
- 546 Lewis, C., Perry, R., & Murata, A. (2006). How should research contribute to instructional improvement? The
547 case of lesson study. *Educational Researcher*, 35, 3–14.
- 548 Lewis, C., & Takahashi, A. (2013). Facilitating curriculum reforms through lesson study. *International Journal
549 for Lesson and Learning Studies*, 2(3), 207–217.
- 550 Ministry of Education (MOE). (2009). Speech by Dr Ng Eng Hen, Minister for Education at the MOE Work
551 Plan Seminar 2009. Retrieved from <http://www.aps.sg/files/speeches/Speech-by-Dr%20Ng%20Eng%20Hen,%2017%20Sep%202009.pdf>. Accessed 02 March 2017.
- 552
- 553 Perry, R. R., & Lewis, C. (2009). What is successful adaptation of lesson study in the US? *Journal of Educa-
554 tional Change*, 10(4), 365–391.
- 555 Phillips, D., & Ochs, K. (2003). Process of policy borrowing in education: Some explanatory and analytical
556 devices. *Comparative Education*, 39(4), 451–461.
- 557 Ratnam-Lim, C. T. L., & Tan, K. H. K. (2015). Large-scale implementation of formative assessment practices in
558 an examination-oriented culture. *Assessment in Education: Principles, Policy & Practice*, 22(1), 61–78.
- 559 Rock, T. C., & Wilson, C. (2005). Improving teaching through lesson study. *Teacher Education Quarterly*,
560 32(1), 77–92.

- 561 Saito, E., & Atencio, M. (2013). A conceptual discussion of lesson study from a micro-political perspective:
 562 Implications for teacher development and pupil learning. *Teaching and Teacher Education*, *31*, 87–95.
- 563 Saito, E., Tsukui, A., & Tanaka, Y. (2008). Problems on primary school-based in-service training in Vietnam:
 564 A case study of Bac Giang province. *International Journal of Educational Development*, *28*(1), 89–103.
- 565 Seddon, T., Ozga, J., & Levin, J. S. (2013). Global transitions and teacher professionalism. In T. Seddon &
 566 J. S. Levin (Eds.), *Worlds yearbook of education 2013. Educators, professionalism and politics: Global*
 567 *transitions, national spaces and professional projects*. London: Routledge.
- 568 Steiner-Khamsi, G. (2014). Cross-national policy borrowing: Understanding reception and translation. *Asia*
 569 *Pacific Journal of Education*, *34*(2), 153–167.
- 570 Stigler, J., & Hiebert, J. (1999). *The teaching gap*. New York: Free Press.
- 571 Stigler, J. W., & Hiebert, J. (2016). Lesson study, improvement, and the importing of cultural routines. *ZDM*
 572 *Mathematics Education*, *48*(4), 581–587.
- 573 Suzuki, Y. (2012). Teachers' professional discourse in a Japanese lesson study. *International Journal for*
 574 *Lesson and Learning Studies*, *1*(3), 216–231.
- 575 Takahashi, A. (2014). The role of the knowledgeable other in lesson study: Examining the final comments of
 576 experienced lesson study practitioners. *Mathematics Teacher Education and Development*, *16*(1), 4–21.
- 577 Takahashi, A., & McDougal, T. (2016). Collaborative lesson research: Maximizing the impact of lesson study.
 578 *ZDM Mathematics Education*, *48*(4), 513–526.
- 579 Warwick, P., Vrikki, M., Vermunt, J. D., Marcer, N., & Halem, N. V. (2016). Connecting observations of student
 580 and teacher learning: An examination of dialogic processes in lesson study discussions in mathematics.
 581 *ZDM Mathematics Education*, *48*(4), 555–569.
- 582 Watanabe, T. (2002). Learning from Japanese lesson study. *Educational Leadership*, *59*, 36–39.
- 583 Watanabe, T., Takahashi, A., & Yoshida, M. (2008). Kyozaikenkyu: A critical step for conducting effective
 584 lesson study and beyond. In F. Arbaugh & P. M. Taylor (Eds.), *Inquiry into mathematics teacher education*
 585 (Vol. 5, pp. 131–142). San Diego: Association of Mathematics Teacher Educators (AMTE) Monograph
 586 Series.
- 587 Yoshida, M. (2012). Mathematics lesson study in the United States: Current status and ideas for conducting
 588 high quality and effective lesson study. *International Journal for Lesson and Learning Studies*, *1*(2),
 589 140–152.

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