EDUCATIONAL DESIGNER
JOURNAL OF THE INTERNATIONAL SOCIETY FOR DESIGN AND DEVELOPMENT IN EDUCATION

Designing Japanese Lesson Study as a teacher professional development program in a Philippine setting

Cultural considerations, challenges and opportunities

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Abstract

Over the past two decades, there have been many efforts to translate Japanese Lesson Study to other countries. Most of these efforts employed a simple "copy-paste" model that does not take into account culturally-rooted conventions and practices, or differences in pedagogical beliefs and values. This study proposed a culturally embedded approach to implementing Lesson Study that critically considers disparities between Japan and the Philippines as seen through Hofstede's dimensions of national culture. Results from two surveys of teachers identified areas of tensions and incongruences between Japanese and Filipino teachers, and informed the design of a Lesson Study implementation at two Philippine public high schools. At the end of three cycles of Lesson Study, many beliefs and skills of the 13 participating teachers had shifted positively in favour of Lesson Study. This study showed that a culturally embedded approach enhances chances of a successful Lesson Study implementation, and could inform Lesson Study in other contexts.

Introduction

Philippines had poor performance in the last two Trends in International Mathematics and Science Studies (TIMSS) that it participated in. This is a clear indication that there is a need for change in teaching if it wants its students to be at par with their counterparts from other countries (Mullis, 2000; Martin, Mullis, Chrostowski, & International Association for the Evaluation of Educational Achievement, 2004). Existing strategies for professional development of teachers mainly comprise of generic mass training of teachers (MTT), and the echoing of teachers who take turns in attending conferences and workshops. These do not guarantee translation of new teaching practices into classrooms, and thus are ineffective (Villegas-Reimers, 2003). With the Philippines' transition to a K-12 curriculum, teachers need a professional development program that can continuously provide them with more relevant and contextualised support, that is, a school-based professional development program (Villegas-Reimers, 2003; Gallos & Herrington, 1997).

Japan's consistently good results in international education tests have been attributed to Japanese Lesson Study (LS), a school-based collaborative professional development activity for teachers (Stigler & Hiebert, 1999; Ebaeguin & Stephens, 2014). Many international educators, who have been impressed by the capacity of Lesson Study to foster student learning and sustained professional growth for teachers, have implemented it in their own contexts (Chokshi, 2002; Inprasitha, 2011; Lewis, 2002; Lewis & Tsuchida, 1999; Stigler & Hiebert, 1999; Pierce & Stacey, 2011). However, the spread of LS to different countries over the past few decades has tended to rely on a simple transference model or a 'copy-paste' method with no attempt to address its cultural compatibility. With teaching and learning being profoundly cultural activities and with Japanese LS originating from a practice that is more than a century old (Shimizu & Chino, 2015, p. 123), it would be naive not to assume that culture would contribute to the extent to which LS can be faithfully translated into and accepted by the teachers of the importing country. In what way then should LS be adjusted if it is to work well in the Philippine context?

This study looked at the cultural underpinnings of Japanese Lesson Study and how these may hinder or facilitate implementation of LS in another context, particularly in the Philippines. The study's main research question is to find the cultural adaptations needed to facilitate a smooth implementation of Lesson Study in Philippine schools. In particular, the study will examine:

a. What are the cultural underpinnings of Japanese Lesson Study?
b. What are the conditions necessary to facilitate a smooth implementation of Lesson Study outside Japan?
c. What are the potential challenges when implementing LS in Philippine schools?
d. How can these challenges be addressed to facilitate a successful implementation of LS in Philippine schools?
e. What models of implementation are likely to increase the success of Lesson Study in the Philippines?

Japanese LS originated in the 1800s when whole classroom instruction was being introduced to accompany the introduction of universal primary education (Shimizu & Chino, 2015, p. 123). Open classrooms were conducted to encourage the proposal of new teaching methods and teaching curricula. Inevitably, culture would have contributed in this long evolution of these open classrooms into what is currently known as Japanese LS. Japanese LS has cultural underpinnings that need to be understood and considered if it is to be implemented in a non-Japanese context like the Philippines. Looking at existing literature on LS, this role of culture is overlooked by the many 'copy-paste' implementations, which explains the misconceptions on and the challenges LS faces in different national contexts (Fujii, 2014).

To identify and analyse cultural orientations that support key practices in Japanese LS and to find a more critical approach to its implementation outside Japan, Hofstede's (2001) 'dimensions of national culture' were utilised. Hofstede's work focussed on comparing work-related values, behaviours, institutions, and organisations across nations

and his landmark studies, which commenced in the 1980s, were based on extensive samples of IBM employees who provided him with nearly perfectly matched samples across countries (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010). His work is often used in business, marketing and in human resource training (de Mooij, 2010; Henseller, Horváth, Sarstedt & Zimmermann 2010). His dimensions of national culture, namely power distance (PDI), individualism versus collectivism (IDV), masculinity versus femininity (MAS), uncertainty avoidance (UAI), and long-term orientation (LTO), were used to focus on particular features of LS in Japan. It is also crucial to identify LS practices that are aligned with what the teachers value in their profession. Thus, what the teachers value when planning a good mathematics lesson (values orientation), as implied by LS, were also looked at. This study argues that a good understanding of a school's cultural orientations and the teachers' values orientation is an important consideration to successfully implement LS.

Methodology

This study consisted of an initial orientations survey study and a subsequent school research study. The orientations survey study set out to answer research question (a) above (cultural underpinnings of Japanese LS), question (b) (conditions necessary to facilitate smooth implementation of LS outside Japan, and question (c) (potential challenges when implementing LS in Philippine schools). The school research, which is the main study, was directed to answer question (d) (addressing identified challenges to facilitate a successful implementation) and question (e) (model/s of implementation that are likely to increase the success of LS practice in Philippine schools).

Instruments

Two instruments were utilised for the study. First is the Values Survey Module for Teachers 2012 (VSMT12) which is adapted from the Values Survey Module 2008 (Hofstede, 2010). This instrument was used to determine the school's cultural orientations based on the dimensions of national culture. The other instrument is the Mathematics Teachers' Perceptions of a Good Mathematics Lesson (MTPGML) which was developed by the researcher to determine teachers' values orientations and design perspectives. This second instrument was based on a synthesis of existing literature on Japanese LS, in which key aspects of mathematics teaching as implied by Japanese LS are embedded (Fernandez & Yoshida, 2004; Lewis, 2002; Lewis, Perry & Hurd, 2004). The 9 items can be seen in Table 1 below.

Orientations Survey Study

Both instruments were administered to a convenience sample of 70 junior high school teachers in Japan, 16 of whom were mathematics teachers, and 131 high school teachers in the Philippines, 22 of whom were mathematics teachers. Because the 16 mathematics teachers from Japan mostly came from Tokyo, another round of MTPGML, in the form of an online questionnaire, was administered by the researcher drawing upon a wider sample of schools, resulting in a further 41 responses coming from different parts of Japan. This gave a total of 57 mathematics teachers in the Japan sample. The non-mathematics and mathematics teachers from each sample included both novice and

experienced teachers. The results of this orientations survey study provided an initial comparison between the Japanese and Philippine samples and groundwork for the subsequent school research study.

School-based research in the Philippines

The subsequent study, comprised of two phases, was conducted in two public secondary schools in the Philippines. School A is a rural school, and School B is an urban school attached to a university. The first phase of this study involved administering VSMT12 to *all* teachers in both schools and MTPGML only to the mathematics teachers. Results from the first phase informed the proceedings of the second study which only involved the mathematics teachers. An intensive training on LS was given to all mathematics teachers in each school, and then, on a 'voluntary basis', eight teachers from School A (four year 7 and four year 8) and five teachers (all year 7) from School B, proceeded to implement two to three cycles of LS in their respective schools over a period of seven months (two to three months per cycle). Initially the researcher was actively engaged as facilitator, followed by a gradual release of responsibility to the teacher participants. This means in the last cycle, the teacher participants were completely in charge of the planning and implementation of the research lesson, while the researcher took on a passive role as a member-observer in the group.

With most of its characteristics parallel to the process of LS, design-based research (Anderson & Shattuck, 2012; Barab & Squire, 2004; Cobb, Confrey, diSessa, Lehrer & Schauble, 2003) easily lent itself as the research methodology for the main study. How the thirteen participating teachers progressed through each cycle was analysed using teacher reflections and interviews, which then informed the changes in the strategies and focus of the succeeding cycle. At the end of three LS cycles in School A and two cycles in School B, the participating teachers where asked to re-take the MTPGML to see if there was any shift in their values orientations. Exit interviews were conducted where teachers were asked to reflect on their LS experience, focussing on the shifts in their values orientations, and to analyse a mathematical task and a student's solution to that task. All teachers were asked to submit several lesson plans: one provided by the Department of Education, one they had designed prior to the LS intervention, one during the LS intervention, and one after the LS intervention. Using mixed data analysis and cross-iteration comparison, all teacher artefacts were analysed and compared with their MTPGML results to see both whether they validate each other and to identify areas of teacher change.

Results

Orientations Survey Study

Figure 1 below shows the VSMT12 results for the Japanese and Philippine samples. The data shows that the Japanese sample tended to be moderately hierarchical and individualistic, which means they acknowledge positions of power but do not let these features intimidate them when in a collaborative environment - everyone's opinion or ideas should be heard. Furthermore, this sample of Japanese teachers endorsed

moderately feminine qualities, which means instead of competitiveness in a group, consensus is usually preferred and harmony within the group is generally sought. Also, the Japanese sample was moderately *uncertainty avoiding* and moderately *long-term oriented* which means attention to detail is valued and a certain level of commitment could be expected from them (de Mooij, 2010; Hofstede, 2001; Hofstede, Hofstede & Minkov, 2010). The VSMT12 results of the Philippine sample are generally similar to those of the Japan sample. This evidence suggests an absence of any major problem arising from the values orientations for introducing LS to these teachers.

Figure 1. VSMT12 results for the Japan and Philippine samples

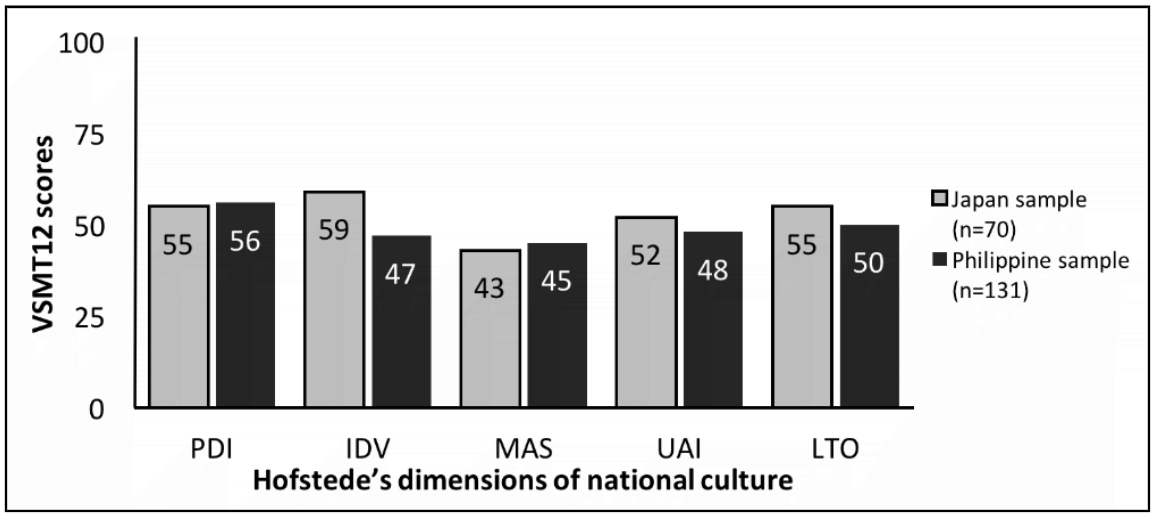


Table 1 summarises the results of MTPGML administered only to the mathematics teachers in Japan and Philippine samples. From Table 1, combining the percentages for Very Important (VI) and Essential (E) shows that the Japan sample has very strong endorsements for eight out of the nine key elements. The Japan sample's relatively low response to Item 2 (31% VI and 18% E) compared with teachers in the Philippine sample (50% VI and 23% E) on *"Working with other teachers to plan a lesson"* may appear strange. However, this may be explained by the fact that Japanese teachers distinguish clearly between those occasional lessons that are planned with other teachers as part of LS and those lessons that are part of day-to-day teaching which they are more likely to plan alone. Item 1 (Researching curriculum materials), Item 4 (Identifying in advance the range of expected student responses), and Item 9 (Getting involved in school research) were considered E by 54%, 63%, and 54%, respectively, of the sampled Japanese teachers. In contrast, Item 4 and Item 9 were rated E only by 9% and 14%, respectively, of the sampled Filipino teachers. Since LS is a collaborative activity, other people's opinion is as important as one's own when determining the success of a lesson, so it is important to get lower values for Item 7 (Relying on one's own opinion in determining success or failure of a lesson). On Item 3, 53% of the Japanese sample and 19% of the Philippine sample were between Undecided and Not Important, which is consistent with both samples' endorsement of having other teachers in the classroom to observe teaching. This is supported by the Japan sample's moderate IDV orientation. Furthermore, the moderate *uncertainty avoiding* (UAI) and *long-term* (LTO) orientations support many of the items below, particularly the strong inclinations for attention to detail in lesson planning and engagement in research.

Table 1. Mathematics Teachers' Perceptions of How to Prepare a Good Mathematics Lesson

Items	Japan (%) (n = 57)				Philippines (%) (n=22)			
	NI	U	I	VI/E	NI	U	I	VI/E
1. Using/researching curriculum materials (national curriculum, textbooks, course syllabus, scope and sequence, etc.) in planning your lessons.	0	3	11	86	0	0	9	91
2. Working with other teachers to plan a lesson.	0	19	32	49	5	5	18	73
3. Having other teachers in the classroom to observe my teaching.	0	0	17	83	23	5	59	14
4. Identifying in advance the range of expected student responses to the task, including likely wrong responses, in a problem-solving lesson.	0	2	3	95	0	0	50	41
5. Writing a detailed lesson plan addressing the range of expected student responses.	5	16	21	58	32	32	18	19
6. Talking about and sharing successful maths lessons with colleagues.	0	0	28	72	0	5	41	54
7. *Relying on my own opinion whether a lesson has been successful or not.	53		33	12 2	14		64	18 5
8. Evaluation of a lesson through analysing collected samples of students' solutions and attempted solutions.	2	3	25	70	0	0	9	91
9. Getting involved in school research.	0	3	18	79	0	9	36	55

Notes: NI = Not Important, U = Undecided, I = Important, VI = Very Important, E = Essential

Shading indicates combined percentages of Very Important (VI) and Essential (E) ≥ 50%.
* Lower values are important for this item.

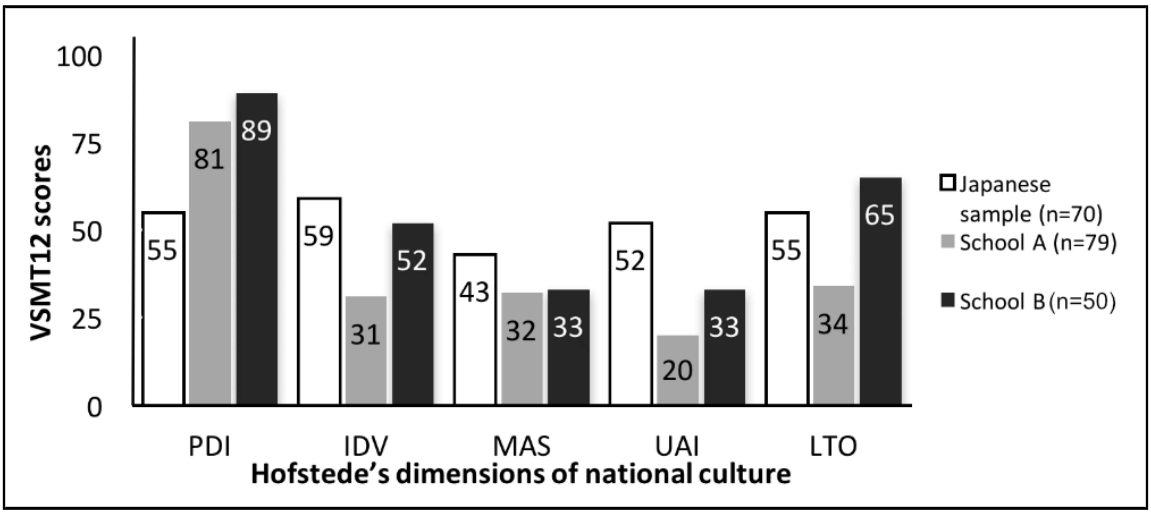
The Philippine sample's weak endorsements for Items 3, 4, 5 and 7 seem to be inconsistent with its moderate *individualism* (IDV), *uncertainty avoidance* (UAI), and

long-term (LTO) orientations. With apparent cultural strengths in each of the factors that would seem to suit lesson study, these data suggest why Japanese teachers seem to be able to engage meaningfully in LS and what could be potential sources of tension for the Philippine teachers, answering question (c) of the study. The clearest divergences in terms of lesson design are shown in responses to Items 4 and 5, especially in Item 4 where 58% Japanese teachers considered Very Important or Essential *Writing a detailed lesson plan addressing a range of expected student responses* compared to 19% of the Philippine sample.

School-based research study in the Philippines

Figure 2 below shows the results obtained during the first phase of the study in Schools A and B. These results reveal disparities in each Hofstede dimension between mathematics teachers in the Japan sample and the two Philippines schools. These suggest potential sources of tensions or design challenges when implementing LS in Philippine schools. Power distance index (PDI), which relates to hierarchy, and uncertainty avoidance index (UAI), which relates to openness to change and attention to detail, are major considerations and needed to be addressed. Figure 2 also reveals that even though School A and School B are from the same country, they appear to have different cultural orientations, as can be seen in *individualism versus collectivism* (IDV) and *long-term versus short-term orientation* (LTO). This means a different set of strategies would need to be employed between the two schools.

Figure 2. VSMT12 results for the Japan sample, Philippine School A, and Philippine School B



With the VSMT12 results at hand, the researcher needed to design strategies that could address the issues on high PDI, low UAI and low LTO (for school A). For example, the researcher requested the immediate supervisors like the department head and the district supervisor for mathematics to be involved to keep the teachers in the program and to encourage them to take activities seriously. To ensure that the presence of superiors and a 'seniority complex' did not skew discussions, the researcher as the facilitator made sure that everyone's opinions were heard and that tasks were fairly delegated to everyone, allowing novice teachers to take on important roles. There was also a gradual release of responsibility from the researcher to the teachers. To address the low UAI, the researcher allocated more workshops on anticipating the widest range of student responses to

problem-solving tasks and provided support for such responses to help teachers see the benefits of writing a detailed lesson plan. Because School A had low IDV, the researcher encouraged the teachers to write their reflections on what they learned independently.

Table 2 shows the pre-LS results of MTPGML for the Japanese sample, School A and School B. The strong alignment between the key aspects of LS and what the Japanese teacher sample valued in lesson planning helps explain further why LS works smoothly in Japan. Comparing the values orientations of both participating schools to the Japanese sample allowed the researcher to identify the focus of the sessions. For instance, teachers from both schools (A and B) need to be convinced about the value of having other teachers observe their teaching and of writing a detailed lesson plan addressing the range of expected student responses. Also, it should be noted that teachers from both schools were quite different in terms of their values orientations. This phase of the study was set out to address question (d) of the study. Teachers in School A, the rural school, needed more explanation of aspects which were the focus of their training sessions, whereas teachers in School B seemed to be willing to go along with what was proposed by the researcher.

These results from VSMT12 and MTPGML guided the progression of the teachers through each LS cycle. Over a period of seven months, the researcher worked with teachers in School A, meeting them twice a month, whereas meeting the teachers from School B even once a month proved to be a challenge. One reason for this difficulty was the availability of the teachers. School B was in the middle of moving to a new campus and the teacher in charge of Year 7 mathematics was on leave. Over the seven-month period, two LS cycles were conducted at School B, while School A conducted three.

At the end of the intervention, the participating teachers were again asked to take MTPGML. The shifts in their values orientations, if any, are indications of teacher growth. This analysis of the shifts was done for each Philippine school and for both Philippine schools combined. The very small sample size, which is a clear limitation of the study, limited the analysis of the results.

Table 2. MTPGML results for the Japan sample and pre-LS for School A and School B

	Japan sample (%) n = 57				School A (%) n = 7				School B (%) n = 4			
Items	**NI**	**U**	**I**	**VI/E**	**NI**	**U**	**I**	**VI/E**	**NI**	**U**	**I**	**VI/E**
1. Using/researching curriculum materials (national curriculum, textbooks, course syllabus, scope and sequence, etc.) in planning your lessons.	0	3	11	86	0	14	0	86	0	0	0	100
2. Working with other teachers to plan a lesson.	0	19	32	49	14	0	43	43	0	0	25	75
3. Having other teachers in the classroom to observe my teaching.	0	0	17	83	29	0	57	14	0	0	100	0
4. Identifying in advance the range of expected student responses to the task, including likely wrong responses, in a problem-solving lesson.	0	2	3	95	0	43	43	14	0	0	0	100
5. Writing a detailed lesson plan addressing the range of expected student responses.	5	16	21	58	14	0	57	29	0	25	25	50
6. Talking about and sharing successful maths lessons with colleagues.	0	0	28	72	17	0	50	34	0	0	0	100
7. *Relying on my own opinion whether a lesson has been successful or not.	43		33	12 2	29		57	14 0	75		25	0 0
8. Evaluation of a lesson through analysing collected samples of students' solutions and attempted solutions.	2	3	25	70	14	0	14	71	0	0	0	100
9. Getting involved in school research.	0	3	18	79	14	0	29	57	0	0	25	75

Notes: NI = Not Important, U = Undecided, I = Important, VI = Very Important, E = Essential. Shading indicates combined percentages of *Very Important* (VI) and *Essential* (E) ≥ 50%.

* Lower values are important for this item.

At this point, the unit of analysis now shifts to the individual items in MTPGML and how the shifts in each item correspond to the teachers' responses in their exit interviews. Table 3 summarises the endorsements of the teachers from School A and School B, pre- and post-LS intervention.

Teachers from School B seem to have changed little from their endorsements which were mostly high and desirable to begin with. However, in the exit interview when they were asked to analyse a problem-solving task and a student's solution to the task, many teachers in School B struggled to describe a possible flow of a lesson using the task and to hypothesise student's reasoning behind the sample solution. This finding does not align with their strong endorsement for item 4 "*Identifying in advance the range of expected student responses to the task, including likely wrong responses, in a problem-solving lesson*".

Teachers from School A experienced more shifts in their values orientations. A major shift in item 4 can be seen in Figure 3, which shows the endorsement for item 4 of the Japanese sample, and School A teachers, pre- and post-LS. Exit interview from teachers supported this finding.

A1, an experienced teacher of 5-10 years of teaching: *"It helped me to construct a good lesson plan wherein we need to consider the students' anticipated responses. It's only now that I realised the need to consider these because you can use them to develop the flow of your lesson by connecting the students' ideas from one another."*

A5, another experienced teacher: *"Readiness in dealing with my students every day. Usually, we only expect the correct answer to be given. When a wrong answer is given, we assume that all the wrong responses are the same. But through LS, we consider all possible student responses so we're able to prepare responses in case a wrong response comes up."*

In contrast, B1, a teacher with more than ten years of teaching experience, was not so confident about this aspect: *"The range of expected… my point of view is it's important because you can anticipate the problem [in the actual class] if you've prepared the expected student responses [beforehand]. I'm thinking…you can't really anticipate [everything]… especially by yourself…"*

Table 3. Participating teachers' endorsements pre- and post-LS intervention

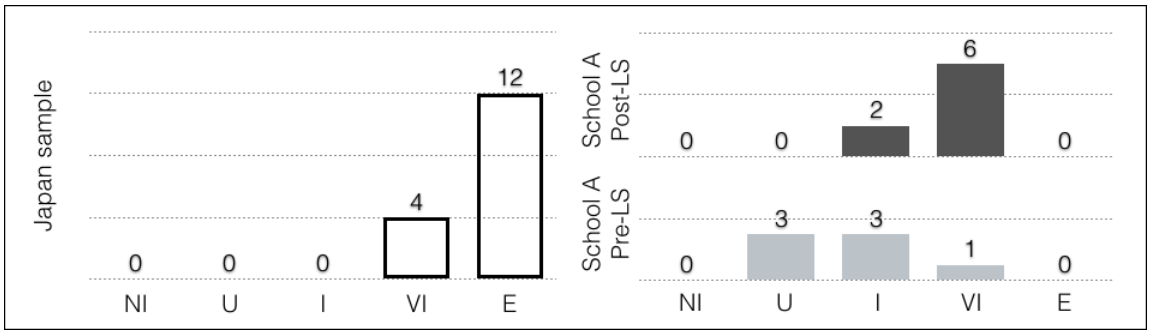
	School A (%)								School B (%)							
	Pre-LS (n=7)				Post-LS (n=8)				Pre-LS (n=4)				Post-LS (n=5)			
Items	NI	U	I	VI/E	NI	U	I	VI/E	NI	U	I	VI/E	NI	U	I	VI/E
1. Using/researching curriculum materials (national curriculum, textbooks, course syllabus, scope and sequence, etc.) in planning your lessons.	0	14	0	86	0	0	12	88	0	0	0	100	0	0	0	100
2. Working with other teachers to plan a lesson.	14	0	43	43	0	0	25	75	0	0	25	75	0	0	40	60
3. Having other teachers in the classroom to observe my teaching.	29	0	57	14	0	37	50	13	0	0	100	0	0	20	60	20
4. Identifying in advance the range of expected student responses to the task, including likely wrong responses, in a problem-solving lesson.	0	43	43	14	0	0	25	75	0	0	0	100	0	0	0	100
5. Writing a detailed lesson plan addressing the range of expected student responses.	14	0	57	29	12	13	62	13	0	25	25	50	0	20	60	20
6. Talking about and sharing successful maths lessons with colleagues.	17	0	50	34	0	0	50	50	0	0	0	100	0	0	0	100
7. *Relying on my own opinion whether a lesson has been successful or not.	29		57	14	0	25		75	0	0	75		25	0	0	80		20	0	0
8. Evaluation of a lesson through analysing collected samples of students' solutions and attempted solutions.	14	0	14	71	0	0	25	75	0	0	0	100	0	0	0	100
9. Getting involved in school research.	14	0	29	57	0	0	75	25	0	0	25	75	0	0	20	80

Notes: NI = Not Important, U = Undecided, I = Important, VI = Very Important, E = Essential

Shading indicates items with considerable values orientation shifts.

*Lower values are important for this item.

Figure 3. Endorsement for Item 4 (identifying student responses in advance)



Conclusion

VSMT12 results for the Japanese sample point to important cultural underpinning of the values embedded in LS. The moderate PDI (Power Distance Index) and IDV (Individualism/Collectivism) measures explain the high regard for collegiality, while moderate UAI (Uncertainty Avoidance Index) and LTO (Long Term Orientation) help explain the importance given to detailed lesson planning and to seeing LS as continuous and on-going program of teacher professional growth. These orientations cannot be assumed to be present in other national contexts as seen from the VSMT12 results of the two Philippine schools. In the MTPGML, the consistent strong endorsements of the Japanese sample for the key aspects of LS may explain why Japanese teachers readily participate in and are able to maximise their learning from LS. The clear differences between the Japanese sample and the teachers from schools A and B show that we cannot assume the same values orientations from other teachers. It is likely that many other Philippine schools will yield similar results from both instruments; that is, very high PDI, very low UAI, very low LTO. Our conclusion is that a 'copy-paste' method is likely to not work at all. Orientations that underpin the success of LS in Japan are themselves not easily transported to other countries, if indeed it is possible.

Failing to take account of different cultural and/or values orientations means that tensions, misinterpretations, misconceptions, and even resistance from teachers may arise. Results from the two instruments alerted the researcher to anticipate potential challenges in implementing LS in the two schools. The researcher was far better placed to design a model that incorporated strategies which addressed these anticipated challenges and harnessed identified affordances — that is what a culturally embedded approach requires.

The researcher cautions other implementers of LS, especially in the Philippines, that this study does not provide a recipe for implementing LS in any Philippine school. For both instruments, the two schools shared some cultural and values orientations but they also exhibited differences from each other despite coming from the same country. This means each intervention must be tailored to the needs of the schools. Designing and implementing a LS program should be locally informed.

Furthermore, we recommend that implementers need to be careful in their interpretations of results from the two instruments. It is important to be alert to social

acceptability bias, when respondents give responses they think a researcher wants to hear, or what they think they should say. MTPGML results alone should never be taken as indicators that change has actually occurred. They need to be supported by evidence from what has happened in the classroom and how teachers respond to that evidence. One of the fundamental strengths of LS is to look for evidence of teacher change not in what teachers say, but in what they know and can do. One of the fundamental design principles of LS in its planning stage is to focus on students' thinking processes; and consequently, to direct attention in the lesson implementation and observation stage towards collecting evidence of how students' thinking has been demonstrated, improved and challenged. These data become the basis to build into the next cycle. The above cautions and recommendations provide answers to question (e) concerning what models of implementation are likely to increase the success of LS in the Philippines.

Lesson Study is recognised in many countries as having the potential to foster teacher growth. However, this is not achieved merely by learning the processes and the skills needed to participate in it. The processes and skills that make LS successful in Japan are not simply a set of transportable behaviours that can be shifted seamlessly to other countries. They need to be seen as embodying and reflecting values that are specific to Japan. This study does not claim that culture alone will facilitate LS smoothly as there are other factors that also come to play such as support from the administration, teacher selection, etc. However, knowing the disparities in the orientations with the importing culture allow us to be more strategic in LS design and development of teacher professional change. The study also showed that even within the same country, schools' cultural and values orientations may vary and, thus, different strategies for implementation are needed. This study showed that culturally grounded aspects of LS contribute to how they are embraced by the teachers in the importing culture. A culturally embedded approach to implementation builds on the teachers' cultural and values orientations which can facilitate a locally appropriate implementation of LS. The shift in endorsement of some key aspects of LS analysed at the item level, and reflections from teachers provide solid evidence of teacher professional growth. This shows that LS, if adapted and implemented appropriately to the local environment, can provide teachers with opportunities for sustained professional growth and improved student learning.

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Note & Acknowledgement

This article builds on the paper "Cultural Challenges in Adapting Lesson Study to a Philippines Setting" by M. Ebaeguin & M. Stephens (*Mathematics Teacher Education and Development,* 2014, Vol. 16.1, pp 43-64). The data in Figure 1 was published in the earlier paper. The data from the Philippine sample in Table 1 was also previously published, but the Japanese data comes from an expanded sample (41 participants were added and a minor correction was made). The abstract to the present article was revised on 9 Aug 2019.

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