

Ideas for Establishing Lesson-Study Communities

Many educators in the United States have recently become interested in lesson study, a professional development approach popular in Japan, as a promising source of ideas for improving education (Stigler and Hiebert 1999). Numerous schools and school districts have attempted to use lesson study to improve their teaching practice and student learning (Council for Basic Education 2000; Germain-McCarthy 2001; Lewis 2002; Research for Better Schools 2002; Stepanek 2001; Weeks 2001).

Teachers at one such school, Paterson Public School in Paterson, New Jersey, have been conducting lesson study since 1999. Cynthia Sanchez, a sixth-grade teacher, shared some of her experiences in *Currents* (2002), the Research for Better Schools newsletter:

While preparing the lessons, the group and I were very thoughtful. We looked at everything from how to introduce a new lesson to antici-

pated student responses, the use of the blackboard, manipulatives, and student engagement. This made me realize that there is more to teaching math than just opening a textbook and working on problems, or "spoon feeding" formulas just to get quick answers. (p. 5)

The concept of lesson study originated in Japan, where it is widely viewed as the foremost method of professional development for teachers (Fernandez et al. 2001; Lewis 2000; Lewis and Tsuchida 1998; Shimahara 1999; Stigler and Hiebert 1999; Yoshida 1999). Lesson study is an important feature of the Japanese educational system and has enabled Japanese elementary school teachers to improve their classroom instruction (Lewis and Tsuchida 1998; Stigler and Hiebert 1999; Takahashi 2000; Yoshida 1999). In fact, Japanese mathematics instruction has transformed from teacher-directed instruction to child-centered instruction during the past fifteen years (Lewis and Tsuchida 1998; Yoshida 1999). The ability to make this change has widely been attributed to the efforts of lesson study.

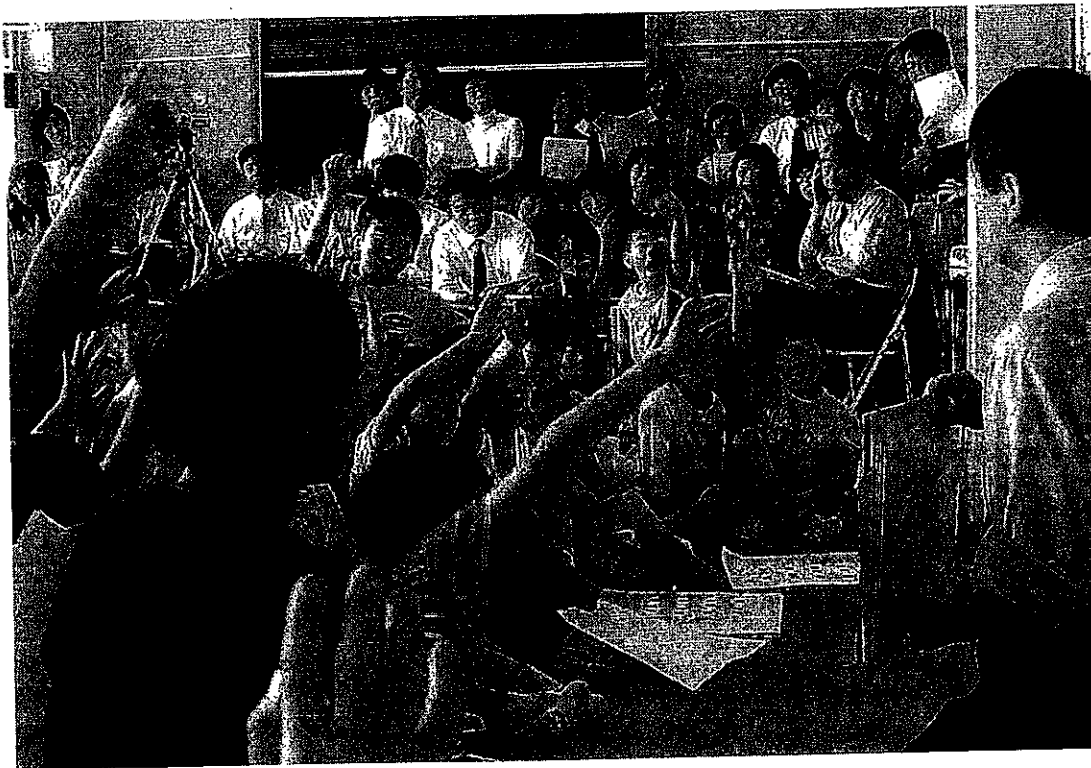
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What Is Lesson Study?

During lesson study, teachers work collaboratively to—

- formulate long-term goals for student learning and development;



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- plan, conduct, and observe a “research lesson” designed to bring these long-term goals to life, as well as to teach particular academic content;
- carefully observe student learning, engagement, and behavior during the lesson; and
- discuss and revise the lesson and the approach to instruction based on these observations (Lewis 2002).

The research lesson is taught in a regular classroom, and participants observe as the lesson unfolds in the actual teaching-learning context. Debriefing following the lesson develops around the student-learning data collected during the observation. Through the lesson-study process, participants are given opportunities to reflect on the teaching process as well as on student learning (Murata and Takahashi 2002; Yoshida 1999). Figure 1 shows a typical model of school-based lesson study. A lesson-planning group develops a research lesson and implements it in a classroom. All the members of the lesson-study group observe the lesson and collect data, then engage in debriefing the lesson. As a result, the lesson is sometimes revised and implemented again in other classrooms. This is called a lesson-study cycle. Other teachers at the school often observe

these lessons. When the school decides to open its research lesson to the public, groups from outside the school such as teachers, educators, and university professors have an opportunity to attend this “lesson-study open house.” At this event, all the participants can observe the research lessons and engage in discussions of those lessons in order to think about improving teaching and learning. This system contributes to the development of new ideas for teaching and learning as well as images of good teaching practices in the classroom.

This article draws on our experiences as practitioners, educators, and researchers of lesson study in the United States and Japan. We describe what lesson study is and why it is significant, and discuss how teachers can begin effective lesson-study activities at their own schools in order to improve teaching and learning.

Why Is Lesson Study Powerful?

Lesson study has played an important role in professional development in Japan since the beginning of Japanese public education more than a hundred years ago. One reason for this popularity might be

that lesson study gives Japanese teachers opportunities to—

- make sense of educational ideas within their practice;
- change their perspectives about teaching and learning;
- learn to see their practice from the child's perspective; and
- enjoy collaborative support among colleagues.

For example, one Japanese teacher said the following about lesson study:

It is hard to incorporate new instructional ideas and materials in classrooms unless we see how they actually look. In lesson study, we see what goes on in the lesson more objectively, and that helps us understand the important ideas without being overly concerned about other issues in our own classrooms. (Murata and Takahashi 2002)

Why is lesson study so appealing to so many researchers and educators in the United States? We think it is because lesson study has certain characteristics that set it apart from typical professional development programs.

First, lesson study gives teachers the opportunity to see teaching and learning as it takes place in the classroom. Lesson study provides the context for teachers to focus their discussions on planning, implementation, observation, and reflection on classroom practice. By looking at actual classroom practice, teachers are able to develop a common understanding or image of what good teaching practice entails, which in turn helps students understand what they are learning.

Another unique characteristic of lesson study is that it keeps students at the heart of the professional development activity. Lesson study provides an opportunity for teachers to carefully observe students during the learning process and discuss actual classroom practice.

A third characteristic of lesson study is that it is teacher-led professional development. Through lesson study, teachers are actively involved in the process of instructional change and curriculum development. Paterson Public School No. 2 in Paterson, New Jersey, a pre-K to grade 8 urban school that serves a population of mostly Latino and African-American students, has been implementing lesson study since 1999. Principal Lynn Liptak shared her thoughts about the differences

between lesson study and traditional professional development in the United States in Lewis's *Lesson Study: A Handbook of Teacher-Led Instructional Change* (2002). Liptak explained that lesson study is teacher-led professional development in which all the participants reciprocally learn from one another's experiences. In addition, the collaboration through lesson study helps reduce isolation among teachers and develops a common understanding of how to systematically and consistently improve instruction and learning in the school. For example, teachers can establish a common expectation for student learning in the classroom and provide consistent and coherent instruction in the entire school. Moreover, lesson study is a form of research that allows teachers to take a central role as investigators of their own classroom practices and to become lifelong, autonomous thinkers and researchers of teaching and learning in the classroom.

Another important characteristic of lesson study is that it has played a significant role in improving curricula, textbooks, and teaching and learning materials in Japan. In fact, most Japanese mathematics textbook publishers employ classroom teachers who are deeply involved in lesson study as authors, and their materials are often based on classroom teaching and learning through lesson study. As a result, the content of student textbooks and teacher guides is focused, connected, and coherent in order to help students construct an understanding of the mathematics they are learning (Schmidt, Houang, and Cogan 2002).

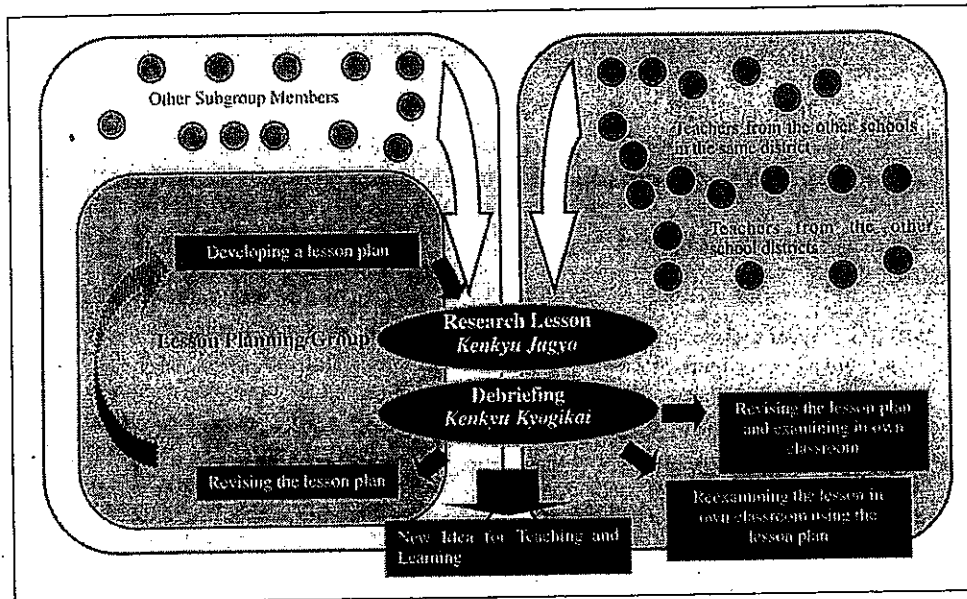
How Can You Begin Lesson Study?

Create an informal study group

Because lesson study is a form of teacher-led professional development, any teacher can begin lesson study by starting to collaborate with other teachers. Effective models of lesson study in Japan often begin as grassroots movements by enthusiastic teachers rather than as top-down formations (see Yoshida [1999] and Lewis [2002]). For example, lesson study at Paterson Public School No. 2 started as a voluntary study group in 1999. Soon, members of the group were able to spread the idea of lesson study at the school and convinced other classroom mathematics teachers to join them. Now, the school is conducting school-based lesson study and trying to provide consistent and coherent

Figure 1

A typical lesson study



mathematics education to its students. Informal study groups that focus on improving mathematics teaching and learning can be a step toward developing a lesson-study group. If you are not already part of such a group, you might initiate the practice by sharing what happened in your mathematics class with your colleagues during a grade-level meeting or prep time. You do not have to begin lesson study with all the teachers at your school. Forming a comfortable, collaborative group is the most desirable step toward beginning successful lesson study.

Experience lesson study

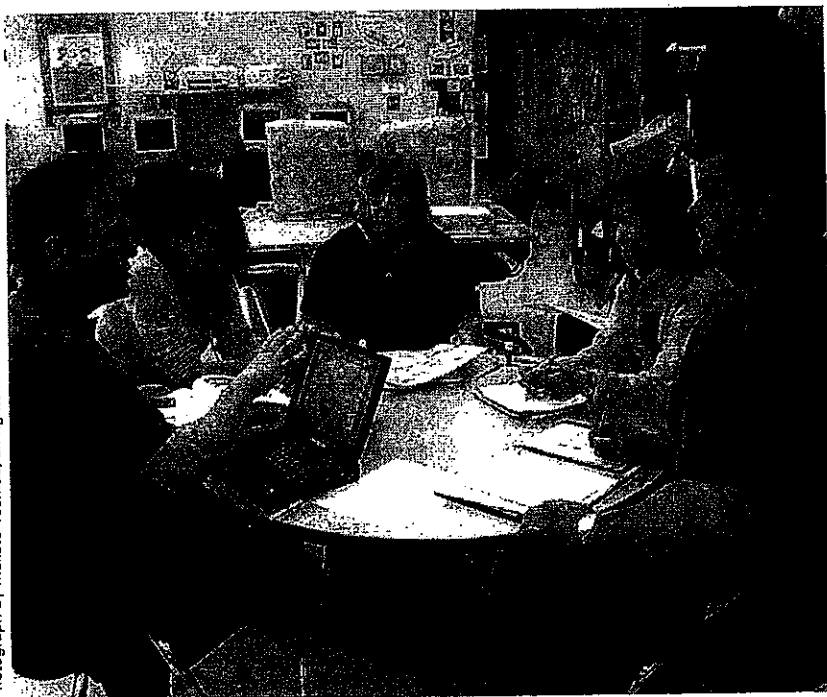
The idea of lesson study is simple: collaborating with fellow teachers to plan, observe, and reflect on lessons. Developing effective lesson study, however, can be a complex process (Lewis 2002). In order to be effective, lesson study must become a cultural activity, woven into the fabric of teachers' everyday teaching experiences. Teachers cannot learn effective lesson study simply by reading about it. They must experience it firsthand by participating in it on a long-term basis. Stigler and Hiebert (1998) and Gallimore (1996) claim that the cultural script can influence observable instructional pattern. The written recommendations, demonstrations, and one-shot workshops that have

characterized U.S. educational reform cannot easily fix or improve the cultural script.

Practicing lesson study makes it possible to learn such subtle yet important things as how a lesson plan for lesson study is different from a traditional lesson plan, why such a detailed lesson plan is necessary, what kinds of data must be collected during observation in order to conduct meaningful discussions, and how to carry out effective debriefings.

Identify your research goal or theme

All the members of the lesson-study group determine the lesson-study goal or theme and the subject to study. For example, the Chicago Lesson Study Group, a small group launched in the fall of 2002, decided to investigate how to improve the teaching and learning of measurement in the elementary and middle-school grades. Members of the group chose this theme because standardized test scores showed that measurement was the weakest area in mathematics for their students and because measurement was the most difficult topic for them to teach. This theme emerged from a discussion about what topics teachers found difficult to teach. Paterson Public School No. 2 chose "fostering student problem-solving and responsibility for learning" as its lesson-study goal by identifying



students' weaknesses in mathematics throughout the K–8 program. At the beginning of the 2003–04 school year, however, teachers realized that they needed to expose students to many different solutions to a problem in order to help them develop good problem-solving skills. The students needed to be able to share their ideas and record what was shared to retain their learning. After identifying this professional growth target, the teachers refined their 2003–04 lesson-study goal as “to encourage, record, and share student thinking.” This goal was written not only for the students but also for the teachers. The teachers believed that they were lacking such skills themselves. By developing this goal, the school is trying to cope with inadequate skills among students and teachers in the hope of providing consistent education throughout the school.

Decide on a topic to investigate

Students are the center of classroom teaching; therefore, identifying which topics students have difficulty with is the obvious place to start in deciding on a topic. Another way to choose the topic is to determine the most difficult or uncomfortable topic to teach among the group members. Recent changes in standards or curriculum, or the time of year to conduct the research lesson, might

become issues to consider when choosing the topic. Regardless of how you choose the topic, do not choose an isolated topic for lesson study. Choose topics that are important in the curriculum, and think about the topic as a unit of lessons instead of a single lesson. The word “lesson” sometimes creates a misunderstanding of the lesson-study process. Teachers do work to develop a research lesson, but it must be connected to other lessons in the unit in order to maximize the learning results.

Investigate a variety of materials

Even after identifying a lesson-study theme, it still is too early to develop a lesson plan. Some groundwork is necessary. For example, if a group decides to explore how to teach measurement of the area of a rectangle to fourth-grade students, the group must know how this topic relates to other topics in the same grade, what prior knowledge students should have, and how this topic can help students learn new mathematics concepts in future classes. Moreover, teachers must know what kind of instructional materials various textbooks use to teach this topic to students, and what the research suggests (if anything) about methods for teaching the topic. Good understanding of the content and the relationships among topics is very important in order to carry out effective lesson study. This investigation is called *Kyouzai-kenkyuu* in Japanese. It means studying—

- a variety of teaching and learning materials, such as curricula, textbooks, worksheets, and manipulatives (for example, investigating how the topic you chose relates to the sequence in the curriculum, what prior knowledge is necessary for teaching this topic, and how various instructional materials present new concepts of the topic);
- a variety of teaching methods;
- the process of student learning, including students' typical misunderstandings, mistakes, and anticipated solutions to problems, as well as how teachers can react to them;
- the state of students' learning (what they know or are able to do); and
- research related to the topic.

Japanese teachers often begin this process by examining and comparing teacher's guides published by different textbook companies.

Develop a research lesson and write a lesson plan

Japanese teachers usually make a simple unit plan before developing the research lesson. They first determine the main mathematical concepts they need to help their students understand the topic. They also consider how many lessons they can afford to teach in the unit, how the students can learn new mathematical concepts by recalling their prior knowledge, what are the most important or difficult concepts the students must learn, how the research lesson that introduces important mathematical concepts fits into the whole unit plan, and so on. The Japanese teachers generally believe that one lesson cannot guarantee that all students will acquire the mathematical concepts they need to understand; therefore, they believe that a good instructional plan for the unit is important. Once they have chosen the research lesson topic, the teachers begin developing the lesson and write a very detailed lesson plan.

Japanese teachers use many different types of lesson plans. Although no single universal form is available, every lesson plan is expected to provide lesson-study participants with such information as—

- why the lesson-planning group decided to use a certain problem for the lesson;
- why the group chose a particular manipulative; and
- why the group used particular wording for the important questions.

To answer these questions, a typical lesson plan includes the title of the lesson, the lesson goal, the relationship to the standards or curriculum, information about the lesson (such as the background and rationale), the expected learning process, and evaluation points to determine whether students are learning. Teachers in a novice lesson-study group might want to begin writing their lesson plans using the provided lesson-plan format.

Conduct a research lesson and a debriefing

Respecting the natural atmosphere of the class is always a priority during a research lesson; therefore, a research lesson ideally should be held in the instructor's regular classroom. If the regular classroom cannot hold enough participants, however, the instructor might teach the research lesson in a larger classroom. Out of respect for maintaining

the natural environment, neither the members of the lesson-planning group nor participants should give any advice, coaching, or comments to students because (1) it distracts from the natural interaction between the students and the instructor; (2) it affects the data that the lesson-planning group is collecting; and (3) in the regular class, having many teachers helping the students is not common.

The main goals of observing a research lesson are to understand student thinking and learning processes, collect the data to back up those points, and determine how students received the plan of the lesson so the observers understand what the teachers intended to teach. To collect the most useful data, observers must adhere to the following guidelines:

- Collect data with the lesson goal in mind.
- Use the lesson plan, seating chart, and worksheets to record observations.
- Document student learning processes, including the many ideas for solving the problem, common misunderstandings the students had, and how and when their understanding changed.

A debriefing is usually held immediately after the research lesson. Holding the debriefing in the classroom in which the research lesson was held might be a good idea because participants can see the blackboard writing and the materials that the



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students used during the lesson. In addition, teachers should bring all the resources (such as textbooks, teacher's manuals, and manipulatives) that they used to develop the lesson, as well as data collected from the lesson (such as observation notes, students' worksheets and notebooks, and notes from pilot lessons).

Before the debriefing, several people should be assigned to conduct the debriefing session—usually a facilitator, a recorder (note taker), and a final commentator. The facilitator, who typically is one of the more experienced lesson-study practitioners at the school, keeps the discussions focused during the debriefing. The note taker keeps minutes of the meeting and is responsible for writing a summary of the important things discussed.

The debriefing session usually begins with an instructor's short comments on his or her teaching. The instructor addresses how the lesson went, what difficult decisions he or she made during the lesson, and what he or she would like to discuss with participants. Next, a member of the lesson-planning group explains the lesson plan. The instructor's comments and the lesson-plan explanation are meant to set the focus and tone of the discussion. Therefore, the lesson-planning group must carefully think about these comments in order to lead the discussion toward the predetermined goals. The facilitator must also know the goals so that he or she may direct and guide the discussion appropriately.

Next, data collected by the lesson-planning group may be discussed in relation to the focus of the discussion previously identified. The main purpose of the discussion is to find out how the students understand and learn the topic through the research lesson. Discussing student learning based on the evidence collected during the observation is important.

Afterward, the discussion is open to all the participants, usually beginning with a focus on the topics of discussion, then gradually opening up to a more general discussion. Discussion is always focused on the lesson, however, not on other topics such as how the school conducts lesson study, how teachers create time to do lesson study, and so on. Remembering that the skill of the facilitator greatly affects the quality of the discussion is important.

At the end of the session, a final commentator (*Koshi*) is given an opportunity to summarize the session. In the United States, the final commentator is usually invited from outside the group or school. Sometimes the commentator is the person

conducting lesson study with the group as an outside advisor, or is someone who does not know much about the group's lesson study but is able to contribute his or her pedagogical and content knowledge. Some important qualities that this person should have are—

- the ability to read the audience and provide appropriate comments that help participants learn or want to learn;
- the ability to point out something that no one in the audience noticed but is important to learning about the topic; and
- an attitude that he or she is also a learner through the lesson study and an appreciation of the teachers' efforts.

More information about guidelines for lesson observations and debriefings is available in *Lesson Study: A Handbook of Teacher-Led Instructional Change* (Lewis 2002) and the spring/summer 2002 issue of *Currents* (Research for Better Schools 2002).

Write a summary of a research lesson

Although the research lesson and its debriefing are finished, the lesson-study activity should not end at this point. The lesson-planning team should meet again to reflect on the whole lesson-study process and summarize it in writing. We have already mentioned why a detailed lesson plan that can be a record of the lesson activity is important. Storing or distributing the lesson plan by itself, however, is not effective in developing a professional community of teachers. Accompanying the lesson plan with teachers' written reflections and samples of students' work to complete the summary of the research lesson is a good idea. Research-lesson summaries in Japan vary in their content, but they usually include what group members have learned in the course of planning, conducting, and discussing the lesson; the notes from the debriefing; and sample student work. The summaries also may include a word-by-word transcription of the segment of the lesson that shows the student-teacher interaction and highlights the learning of the topic. This helps the reader of the report construct a vivid image of what happened during the lesson and helps the writer recall the image.

At the end of the school year, lesson-study groups in Japan often gather all the research-lesson reports to compile a lesson-study report. In school-

based lesson study, each sub-group that developed a research lesson brings its research-lesson reports to the research committee to be compiled as a lesson-study report. The report usually includes the lesson-study goal, the rationale for setting the goal, reflections about lesson study at the school, a summary of achievements, and a list of the investigative/research tasks. These lesson-study reports usually are stored at each lesson-study group site as well as at the board of education and education centers. In addition, some lesson-study groups seek to publish their reports. In Japan, teachers publish more than educational researchers, and many of the research-lesson reports developed through lesson study are available at large bookstores.

Conclusion

Research, as well as many educational associations in the United States, suggests that mathematics classes should shift from traditional teacher-led instruction to student-centered instruction. As a result, many schools and teachers are working hard to change their classroom teaching to maximize student learning. Many educational reports published in recent years encourage collaboration among teachers. Professional development through lesson study provides many qualities of the professional development approaches that have been suggested to improve classroom practice and learning. It is collaborative and concrete, and it has student learning and understanding as its center. It is continuous and teacher-led. The lesson-study approach permits teachers to be involved in professional development as active learners, as they expect their students to be involved in their own learning.

The following Web sites contain information on future research lesson events and lesson study:

- Global Education Resources:
www.globaledresources.com
- Lesson Study Group at Mills College:
www.lessonresearch.net
- Lesson Study Research Group at Teacher's College, Columbia University:
www.tc.columbia.edu/lessonstudy
- Research for Better Schools:
www.rbs.org/index.shtml

Beginning lesson study and embarking on the road to improving teaching is within the reach of any teacher or group of teachers with enthusiasm and commitment to the profession.

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