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Lesson Study: A Learner Centered Constructivist Strategy

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What is Lesson Study?

Within the context of a lesson, the professional development method of 'Lesson Study' enables teachers to collaboratively experiment, analyze and revise the teaching and learning process. It consists of a systematic and iterative cycle of stages with a small group of teachers collaboratively designing, implementing and analyzing a lesson (Shimizu, 2007).

Within the designing stage, the group collaboratively determines the academic and long term learning goals of the lesson and examines relevant resources and the topic and tasks to be posed (Baba, 2007; Lewis, 2002; Shimizu, 2007; Yoshida, 2007). Once the lesson is drafted, the group identifies ways of improving the lesson by considering how students learn, how to capitalize on student responses, what questions will provoke thinking, how to make thinking visible to observation and how to further the lesson's goals. The final stage of design involves determining the lessons procedure and rationale, including blackboard and teaching material use, learning activities, time allotment, teaching and assessment questions, and developing a system for student learning assessment (Baba, 2007; Lewis, 2002; Shimizu, 2007; Yoshida, 2007).

The lesson is taught by one member of the group and observed by the collaborating teachers and knowledgeable others who all take detailed notes of the participant's visible displays of teaching and learning. After the lesson, the group and others meet to reflect on the learning experience and analyze their notes and data collected for evidence of how students learned from the lesson, what they were thinking, where they were having problems and how their thinking changed, revealing connections between student learning and teaching practices (Cerbin & Kopp, 2006).

The second iteration involves returning to the design stage and redesigning the lesson with the new knowledge acquired and repeating the entire process until the lesson meets the set

or newly modified learning goals (Baba, 2007; Lewis, Perry, Murata, 2005; Shimizu, 2007; Yoshida, 2007). This lesson study process enables teachers to experiment with different approaches and philosophies and make best practice improvements founded on evidence of constructive student learning. Finally, the group documents the lesson study, similar to a scientific experiment, with hypothesis or goals, materials, procedure, rationale, observations, data analysis, and conclusion to be make public for others to repeat or further revise the lesson (Cerbin & Kopp, 2006).

How Lesson Study Expresses Constructivist Principles

There are two main theories of constructivism, cognitive constructivism and social constructivism. Cognitive constructivists view learning as active construction of knowledge by the individual through personal experiences whereas social constructivism, based on Vygotsky's theory of learning, view learning as knowledge constructed through social interaction with peers and knowledgeable others in the zone of proximal development using socially established tools for thinking (Cobb, 1994; Von Glaserfeld, 1989; Vygotsky, 1978) Lesson study embodies the constructivist principles of Von Glaserfeld and Vygotsky by requiring learners to construct meaning and connections between learning and teaching practices through experimental learning of the teaching process in collaboration with others.

Learning Is an Active Process Anchored in Authentic Contextual Environments

The goal of lesson study is to empower teachers to be reflective professionals that think like researchers. Through the process of iterative and active experimentation on a single lesson over months and years, teachers actively construct meaning and connections between teaching processes and student's learning (Lewis, Perry, Murata, 2005). It is in this active process of constructing one's own meaning, through adaption of experiences, present knowledge and under-

standing, that learners develop ownership of their knowledge and learning processes (Von Glasersfeld, 1983).

Each lesson study experiment resembles an authentic situation using professional practices and tools and representing real life complexities and occurrences experienced by educational researchers in performing classroom experiments (Cobb, Confrey, DiSessa, Lehrer &Schauble, 2003). Constructivism proposes that learning environments should support multiple perspectives or interpretations of reality, knowledge construction and context rich, experience based activities. (Duffy & Jonassen, 1992) It is through these situated experiments, based in whole and real world contexts, that teachers are able to apply the knowledge acquired in lesson study to other instructional situations therefore deepening their understanding (Anderson, Reder & Simon, 1996; Jonassen, 1999) Through these authentic experiences, teachers develop ownership of the problem and are more motivated and better able to apply their knowledge to practice because of the relevancy and meaningfulness of their learning (Jonassen, 1999).

Bruner (1992) states that the most natural form of organizing ones thoughts is in narrative form, a story in which one cannot separate its parts but most consider it as a whole description of events and valuation. Lesson study is a narrative story about the investigation of the practices of teaching and the resultant learning within the context of a research lesson. Experts in lesson study appear to agree with this constructivist principle by suggesting that to separate the steps and look at them individually would take meaning away from the whole, thereby inhibiting the teacher's overall understanding of the teaching and learning process (Lewis, Perry & Murata, 2005).

Learning Occurs Through Perturbation of Thought Process

Von Glasersfeld (1983, 1988) merges the constructivist theories by stating that learning occurs through perturbation and subsequent viable reorganization of knowledge based on activities, prior knowledge, goals and social interactions of the learner. Von Glasersfeld (1983, 1988) believes that our knowledge of the world or others is not a true representation, but rather a basis for thinking, a viable model of elements of our experiential world which is strengthened by other's corroboration. If the examination or application of the knowledge does not lead to a viable or expected conclusion, the learner either modifies or rejects it and starts again. This method of trial, error, modification or retention of knowledge based on its viability as a model of the experiential world or people, is consistent with the lesson study process of hypothesis, implementation, observation, analysis, reflection and revision of the process of teaching. Furthermore, when the model is discussed and corroborated by others, as in the process of debriefing and reflection in lesson study, the model becomes accepted. The perturbation to teachers thinking is the problematic gap between what we want the students to become verses what they, presently, are in ability, skill, knowledge and quality of learner. With success in creating a model of teaching and learning that provides a solution to the discrepancy between the students we have and the students we want, teachers become motivated to continue the process of lesson study (Brown & Wilburg, 2007; Von Glasersfeld, 1989).

Reflection and the act of verbalizing one's thoughts uncovers inconsistencies or gaps in understanding that if resolved can lead to understanding and knowledge (Von Glasersfeld, 1989). Throughout the process of lesson study, teachers publically discuss their thinking, prior knowledge, rationale, observations, conclusions, gaps in knowledge, anticipated student response etc., resulting in perturbations that, if attended to, can lead to greater understanding of the knowledge of teaching and learning. Without reflection and conversation on the observations

made in lesson study, connections, meaning and knowledge cannot be fully constructed between teaching practices and student learning (Lewis, Perry, Murata, 2005; Von Glasersfeld, 1989).

Learning Occurs Through Social Negotiation

Lesson studies is an interactive, collaborative and reflective study of lessons and student learning in which teachers become interdependent and achieve greater improvement through collaboration. (Stigler & Hiebert, 1999) This is supported by Vygotsky`s theory of the `zone of proximal development` that claims working with others results in greater learning than by the individual themselves (Vygotsky, 1978).

During the process of observation and debriefing, lesson observers will offer different perspectives and observations that will result in discourse that leads to increased understanding and teacher development (Lewis, Perry &Murata, 2006). Each individual constructs their own understanding of their experiences, but it is through a cultural lens that we observe out experiences and negotiate meaning. Through collaboration, teachers will acquire a deeper understanding of teaching and learning through exposure to various perspectives, experiences and meanings and the collaborative negotiation of their meaning (Von Glasersfeld, 1989). Through this negotiation, perturbation, social accommodation and deeper understanding results within the context of individual internalization. Learner's ability to explain and defend decisions is related to the development of metacognitive skills and reflective process, both important components of constructivist theory and lesson study (Von Glasersfeld, 1989).

As discussed previously, situated learning refers to the acquisition of knowledge in whole situations that can be transferred to other similar situations. However, it also refers to learning as the result of social interactions and negotiation of meaning within complex social and cultural

environments (Anderson, Reder & Simon, 1996). Both, cognitive apprenticeship and communities of practice are models of situated learning theory used in lesson study.

Although lesson study lacks a formal instructor, facilitators or knowledgeable others, such as educational or content experts, researchers or experienced teachers, provide cognitive apprenticeship, a theory based on Vygotsky`s "zones of proximal development" and situated learning (Anderson, Reder & Simon, 1996; Brown & Wilburg, 2007; Vygotsky, 1978). Through modeling, coaching or sharing of knowledge within a situated context, these experienced professionals scaffold the learning process (Collins, Brown & Newman, 1989). The process of lesson study can be confusing and teachers often need cognitive apprenticeship in the lesson study process, content knowledge, or debriefing strategies (Brown & Wilburg, 2007). Additional scaffolding can be provided by templates to aid in defining appropriate goals, creating the research lesson, reflection and discussion strategies and collection and analysis of data. In some cases, lesson study groups watch video of lesson study exemplars (Brown & Wilburg, 2007).

Due to the popularity and challenging nature of lesson study, communities of lesson study practitioners are forming across North America. This community shares common language, interpretation of practices and cultural activities which better enables them to collectively practice and support each other in the lesson study process (Brown & Wilburg, 2007). Lave (1991) described communities of practice as a group, sharing similar goals and commitments, assisting each other in joint projects and discussions in the pursuit of improving their area of practice. Ranging from novice teachers to experts, lesson study communities share their knowledge, perspectives, experiences and reflections during their investigation into teaching strategies that improve student learning.

Strengths and Limitations of Lesson Study as a Constructivist Strategy

Limitations

Although many teachers agree to participate in a collaborative lesson study process, many of them are apprehensive about sharing their classroom and lessons with others (Brown & Wilburg, 2007). Teachers are usually unfamiliar with collaborating on their lessons and practices and may fail to see themselves as a community of researchers. In the past, teachers have done their own planning, implementing and reflecting on lessons and teaching practices without the benefit of discourse and collaboration of professional peers. Becoming a member of a community of researching teachers is a dramatic shift and teachers may fail to understand or accept the new role. Additionally, the authentic and ill structured research format for lesson study may overwhelm teachers with its complexities. Brown and Wilburg (2007) state that some of the confusion comes from confusing lesson study with lesson planning or developing inappropriate goals for the lesson. Often teacher's content knowledge undermines their confidence and hinders their ability to answer unstructured questions from students making teachers fearful of the process. Finally, there may be a lack of knowledgeable others that can provide scaffolding, coaching, or apprenticeship to teacher groups resulting in failure to construct substantial meaning during the research process (Brown & Wilburg, 2007).

Strengths

Primarily, professional development has been "telling" teachers how to teach and most of the instruction seemed to have little applicability to the actual practices of teachers in the classroom. In contrast, lesson study encourages teachers to find best practice approaches to student learning through authentic and contextual investigations within their own classrooms. The lesson study process provides scaffolding for the teacher's experiential learning through steps and additional templates or videos of exemplars. Brown and Wilburg (2007) state that evidence sug-

gests that teacher's content knowledge improved through lesson study participation which seemed to result from watching and collaborating with knowledgeable peers. Mentoring by knowledgeable others, resources and the use of video analysis for reflection are all considered necessary in successful models of lesson study (Brown & Wilburg, 2007).

Overall, lesson study is steeped in the main constructivist principles of active contextual engagement with content, problem solving, and collaboration.

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REFLECTIONS:

This was my first large individual project paper in ETEC and it was worth 40% of my mark. As a math and physics teacher, writing is not one of my fortes and I felt this was reflected in my writing of this paper. Although I did a massive amount of research, only including 20% in my paper, after reflection and discussion (constructivist principles), I realized that I had created a wonderful literature review without much personal input. I have rich experiences in lesson study as I have been actively engaged in creating collaborative lessons through this process for the past 3 years, I failed to include my own perspectives. I believe it was because of my valuation of my own experiences and opinion. Since the project was worth a massive 40% and I had only 2000 words to explain why lesson study was a constructivist strategy, I felt that my opinions were irrelevant or lacking in value. In addition, I left out an introduction and, more importantly, a conclusion which would have enabled me to summarize my perspective of lesson study as a constructivist strategy. I believe writing this paper was a valuable experience that will enable to me to write more relevant papers in the future, relevant to my experiences and perspectives. Had I focused more on my audience, my professor that already knows the literature and was familiar with lesson study, I would have realized that my personal perspectives are important. Another metacognitive reflection on my learning is my need to review exemplars to gain further knowledge in this style of writing as I am too analytical and proof driven. In the future, I will pick an area of focus within a topic area and elaborate on its aspects from my perspective, using literature to back up my premises. Just writing that last sentence makes me realize that I don't understand the structure of the paper that I have written as it seems that all my statements should be backed by literature, hence appearing that none of my opinions are original. Interesting that the discourse occurring in this reflection with myself is creating perturbation and subsequent desire to resolve the issue. I am aware that I need to do more research into the topic of writing argument papers. I may also be unaware of what is considered an original thought. I believe if any of my conclusions are based on literature that I need to cite the literature from which the idea was developed. Is this wrong? Need to do more research.