

Visible Thinking

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Mr. Ludka's social studies classroom is dimly lit. The class is studying the history of WWII and a photograph of Hitler at the 1936 Berlin Olympics is projected on the front wall. Taped to the rear wall are perhaps 60 sheets of paper. The sheets documents students' ideas about a video they recently watched on Hitler's life. Using a routine called *Claim-Support-Question*, each student has made a claim about Hitler, supported it with evidence and posed a question about the claim. The students have annotated each other's papers and added their own observations. For example, one student wrote: *Hitler had his own mind*, and gave as support: *He started riots even when told not to*. Another student commented *Yes, this is a good example of how, in his own mind, he would do anything to gain control*. Now, with the visible "wall of argument" behind them, the class begins a lively exploration of the photograph projected in front of them.

In a school down the road, another group of students is also using the classroom wall to make their thinking visible, though the topic is very different. Mrs. Thompson's students are studying electricity and they begin by generating a list of questions: *Can electricity go through water? How does electricity power things? Why is electricity so bright? What happens if we use too much electricity? Can electricity start a fire?*. The questions have been posted on the wall and students annotate them during class discussion. For example, a note posted next to the question, *Can electricity start a fire?* reads: *Yes—because the electricity is very hot because electrons are moving very quickly*. Attached to that note is another that asks: *Why does it go so fast?*

The common spirit of these two classrooms isn't an accident. In both these classrooms, students are practicing *visible thinking*. Their Traverse City, Michigan schools are currently working with Harvard Project Zero¹ on a project called *Artful Thinking*² -- one of several school-based initiatives at Project Zero that are loosely linked by the visible thinking theme. It is a theme that we and our Project Zero colleagues David Perkins and Ron Ritchhart have found to be a very powerful way to teach students to think.

Visible thinking defined

What, exactly, *is* visible thinking? Here's a technical definition: Visible thinking refers to any kind of observable representation that documents and supports the development of an individual's or group's ongoing thoughts, questions, reasons, and reflections. Mind maps, charts and lists, diagrams, worksheets all count as visible thinking *if*— and this is an important *if*-- they reveal learners' unfolding ideas as they think through an issue, problem or topic. So, for example, the sticky notes in Mrs. Thompson's classroom count

as visible thinking because they show how students' ideas change as they connect to and extend their prior knowledge about electricity.

Making students' thinking visible requires some sort of organizing structure, and the Visible Thinking programs at Project Zero use what we call "thinking routines" to loosely guide learners' thought processes. A distinctive feature of thinking routines is that they encourage what cognitive psychologists call *active processing*. They don't ask that students simply list facts. Rather, they encourage students to actively engage with a topic by asking them to think with and beyond the facts they know--- asking questions, taking stock of prior knowledge, probing the certainty of their ideas, and visibly connecting new knowledge to old.

For example, the *Claim-Support-Question* routine used by Ludka's students provides three interrelated categories in which students can reveal and expand on their ideas. Thompson's fourth graders are using a routine called See-Think-Wonder – similar to the KWL routine familiar to many educators -- that helps connect her students' prior knowledge, emerging questions, and new knowledge to come.

Visible Thinking and Student Learning

It's hard to argue against classroom practices that teach students to think. But why go further and argue that students' thinking should be made *visible*? Well, for one thing, visible thinking has a diagnostic function. By providing a visible record of children's thinking, it allows teachers to see what students are learning and where they need help. But it also goes beyond diagnosis to actively support good thinking in a number of ways. For example:

Visible thinking expresses a powerful view of knowledge. Knowledge is a living thing, continually shaped and reshaped by human thought; it can't be represented by neat and orderly lists of facts. Visual representations like the ones used by Ludka and Thompson allow for ongoing annotations, revisions, and additions. And they reveal key relationships between claims and evidence, facts and questions, and certainties and uncertainties. Making these messy, changing, and interlocking relationships visible helps students build authentic knowledge instead of just memorizing facts.

Visible thinking demonstrates the value of intellectual collaboration. When engaged in visible thinking practices, students often work with partners or share their ideas in small groups, eventually adding their thoughts to a larger pool of class ideas. The visible representations that ensue tend to have two important characteristics. First, they illustrate a collaborative conceptual "take" on a topic that is broader and more complex than any individual student's conception. Second, because visible thinking practices emphasize students' own ideas and questions, they tend to draw many students into the discussion, particularly students who usually participate only infrequently in class.

Visible thinking changes the classroom culture. When a teacher works to make thinking visible, the mood in the classroom is palpable. The displays of students' thoughts and questions, the visible representations of their developing ideas, and even the tone of interaction in the class all send a message that thinking is highly valued. In this kind of classroom culture, students have ample opportunities to express and explain their ideas. This in turn encourages students to become more alert to opportunities to think things through for themselves, and helps them become active, curious, engaged learners.

Developing a Schoolwide Culture of Visible Thinking

Recently, Mrs. Thompson's elementary school held a parent night at which the school's Artful Thinking program was highlighted. Visible documentation of student thinking lined the classroom walls, the hallways, the cafeteria, and the gym. Students from several grades acted as docents, explaining the thinking routines that produced the work on display. There was even a place for parents to make their own thinking visible: Large sheets of paper labeled "What Surprised Me" and "What Interested Me" were posted outside the cafeteria and parents were invited to make comments.

The comments were overwhelmingly positive. One parent wrote, "I'm surprised at how smart the kids are"---a particularly revealing comment, since the visible thinking on display didn't so much show students having the "right answers" as it did their evolving thought processes.

It was a proud evening for staff and students. The school principal believes that visible thinking is unique in how it helps teachers make connections across the curriculum and across grades. "It creates a culture of thinking between teachers," she explains. "Now teachers can talk not just about the content of the curriculum, but about the thinking behind the content."

"We've done a lot of staff development and it's really hard to bring a whole staff together. This is a lot more open—teachers can directly look at it and see a connection. It's a way to bring a school together. On top of that, it's good for the kids."

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Project Zero, a research group at the Harvard Graduate School of Education, has investigated the development of learning processes in children, adults, and organizations since 1967. Its mission is to understand and enhance learning, thinking, and creativity in the arts, as well as humanistic and scientific disciplines, at the individual and institutional levels.

¹ Project Zero (<http://www.pz.harvard.edu/>) is an educational research group at the Graduate School of Education at Harvard University.

² *Artful Thinking* is a program currently in development by Harvard Project Zero and the Traverse City, Michigan Area Public Schools. The project is funded in part by a U.S. Department of Education Arts in Education Model Development & Dissemination Grant.