Peter Liljedahl Keynote

Mt. Lassen Math Conference

Research Beginnings:

- If students are not thinking, they're not learning.
- Peter's research questions:
    - Is it in fact true that students are not thinking?
    - If it is indeed true that students are not thinking, then what are they doing?
- 80% of students were not thinking across grades and across contexts. 20% were thinking but only 20% of the time.
- If students are not thinking, what are they doing?
    - Slacking - They don't care what you think of them.
    - Stalling - Can I go to the bathroom? Can I get a drink of water? I need to sharpen my pencil. Stallers care. Legitimate off-task behavior.
    - Faking - They care. They hide behind a facade of on-task behavior.

Mimicking:

- 30% of students are slacking, stalling, or faking. Over 50% are mimicking.
- Students are seemingly on-task but are emulating what you have shown them. They reproduce. Mimicking is not thinking. It's not learning. It is not a learning behavior. It's a production behavior. They produce what you've asked in exchange for praise, gold stars, and grades.
- It is so effective in the short term. If I mimic now, I'll be successful now. Mimicking is highly appealing and addictive.
- It is 100% ineffective in the long term. 100% of students who mimic will eventually start to struggle in mathematics. Mimicking is effective as long as its productivity exceeds the demands of the curriculum. Students acquire new things to mimic over time but do not grow. They lose things they had previously acquired.
- The demands of curriculum will eventually exceed their ability to be productive through mimicking. This typically happens in algebra 1. Mimicking runs out.
- Classrooms look alike wherever he goes and they've looked like this for a very long time: I do, we do, you do. This is where mimicking comes from. Teachers communicate that they don't want students to mimic. Students report that their teachers want them to mimic. This idea of teaching is embedded into the fabric of what it means to teach.

Research Goal:

- Goal: Can we get more students thinking and get them thinking for longer?
- The only way to get students thinking is to break the institutional norms.
- As long as they were breaking norms, students were thinking. Norms were preventing students from thinking. Everything they tried got students thinking more. They weren't teaching students to think. They were liberating students to think.

- Not once in 15 years of research did the normative practice come out as being most effective. Almost always it was dead last in things they tried.
- At the dawn of public education, the goals were conformity and compliance. The goals are different now. We need new practices.

Tasks:

- If we want students to think, we have to give them something to think about.
- Tasks are not all we need. We need a lot more than tasks. They are necessary but not sufficient.
- We need good tasks. They're not hard to find. They're everywhere. They're like pebbles on a beach.
- Noticeable Pattern #1
    - Every time we had a good thinking task it had a low floor. Every student can start. The day to day work of trying to create equity is creating access. That begins with tasks we use. Starting with a task that excludes ⅓ of the students excludes ⅓ of the students from learning that day.
- Noticeable Pattern #2
    - There's a high ceiling. Students learn from a challenge. When students meet a challenge on the heels of success, they are more likely to rise to the challenge than give up. If students meet a challenge without any success, they are likely to give up. Tasks that have a low floor result in initial success.
- Noticeable Pattern #3
    - Good tasks are new or have novelty. They're almost always something the students haven't seen. Thinking is what you do when you don't know what to do.
- Noticeable Pattern #4:
    - A good thinking task almost never had to do with the curriculum. This is a problem, since there's stuff to get through. We can bring patterns #1-3 into the curriculum though. We're drowning in curricular thinking tasks, but we suck the thinking right out of them when we show students how to do them. Thinking classrooms is not about finding some amazing task that tricks students into learning. Thinking classrooms is about building a culture of thinking and then pointing that culture to the curriculum - straight up curriculum right out of the textbook.

Collaborative Groups:

- Strategic grouping and social grouping are highly ineffective to get students to think.
- Students must see the randomness.
- Students are more likely or highly likely to offer an idea. Every student enters the situation thinking they can contribute.
- Groups of three are still most effective, but primary starts with two (to begin with).
- Diversity is not a burden for us to bear. It is a strength when in random groups.

- Community forms. Empathy is unlocked. Group work starts to look different. Kids aren't just patient and tolerant. They start to care about the learning of others, not just their own.
- "I feel like I can be myself in this room."
- Random groups are about equity. "The teacher thinks we're all capable."

Vertical Whiteboards:

- It's the sexiest variable, but there's much more to BTC.
- Risk is a barrier to student thinking. Erasable surfaces reduce barriers to thinking.
- Try more. Try sooner. Try longer.
- Everyone is looking at the work in the same orientation. There's no sideways or upside down view, so all students can't contribute. The same orientation creates equity and access.
- I'm a better teacher, because I can see everything. I don't have to wait until a quiz to know what students are doing. Without vertical spaces, I feel like I'm teaching with a blindfold.
- It's not that standing is so good. It's that sitting is so bad. Sitting students feel anonymous. Anonymous students disengage. They have less access to learning. Standing removes anonymity and creates equal access to learning.

Where We Start:

- Toolkit #1
    - With the above three practices in place, 80% of the students are thinking 80% of the time.
    - All three must be done at once.
    - They don't change the teacher. They change the students.
- Toolkit #2
    - Five practices that are done one at a time in any order.
    - These practices are about changing the teacher.
- Toolkit #3
    - These are the most powerful of the practices.
    - They allow you to tear through content.
- Toolkit #4
    - This is all about assessment.

In Conclusion:

- Thinking classrooms isn't about enrichment. It's not what we do on Fridays or Thinking Thursdays or the week before Christmas.
- Thinking classrooms is about building a culture of thinking and then pointing it at content. Not some fancy dressed-up version of content. Just content, and the kids tear through it.

- When the students are not thinking, everything we teach is difficult. It takes a lot of time, and they don't learn. When kids are thinking, anything is possible.
- Our goal in thinking classrooms is not to find engaging tasks. It's to make engaged students, and then point them at anything we have to do.

Q&A:

- Random group issues:
    - Move the marker around a lot.
    - Don't let a group move on to the next question unless everyone in the group has a chance to understand what happened in the first question. When students get used to this, they realize that there isn't any benefit to rushing through the question, because the teacher's not going to let them move on until everyone in the group understands. This can help shift the behavior in the room.
    - Sometimes we have to adapt our goals when students are *well* outside of the realm of understanding. There is a way to help that student feel included without understanding everything that's going on and while still allowing other students to move forward.
    - In a class of less than 15 students, create random groups of two but put two groups of two next to each other. In order to increase the diversity of thinking in the room, use your own whiteboard to add thinking that's not emerging throughout the room.
- Transference of the thinking classroom space to the rigor of a standardized assessment:
    - There are four practices that help transfer the collective knowing and doing to an individual knowing and doing: consolidation, note taking, CYU, and self-assessment.
- How do you know if everyone understands?
    - You know if everyone understands. When listening to a group working at a whiteboard, you know. Assess through observation of behavior, not through a product.
- Teaching mixed grades:
    - Teach all students in that class together. It is healthy for one grade to see where they're going and for one grade to see what they did again in the grade before.
    - Look for overlap between the two curricula, and also teach everything to everybody. When you teach a thinking classroom, time behaves differently.
- Start with non-curricular or curricular tasks:
    - Always start with non-curricular tasks. It's about building a culture of thinking in a safe space.

We are fatalists. We imagine the absolute worst that can happen. We want answers to every worst case scenario. No one has ever died doing thinking classrooms. Just try it.