

## **Innovations in Thinking and Learning**

### **Jennifer Cooper – Problem-solving Models**

JENNIFER: My first exposure was to integrative thinking. And I remember the first day that I went to my integrative thinking training with Rotman. And I was so excited. I left that day and I felt like my brain was full of so much knowledge. And I came back to my class, and I was so excited to share with them what I had learned. And initially it was a complete failure, because I hadn't prepared them and I hadn't set the conditions. And I learned that I needed to take a step back and first teach them how to communicate with each other, how to respectfully challenge one another, how to make sure everyone in a group has their voice heard. And once I spent some time doing some community-building activities, doing some activities to focus on effective communication, and then went back and tried the first tool that I learned again -- which was causal modelling -- I experienced a lot more success.

And each time I went to the Rotman training I was introduced to a new tool. So I learned about causal modelling and opposable models, and the Ladder of Inference. And it just changed the way that I approach my teaching practice. And I think it gave kids an opportunity to think, so they weren't just looking at facts and regurgitating information. They were thinking about the causality of something. They were challenging their own thinking by trying to find the positive in models they don't agree with. They were looking at their own personal inferences and learning about data that they pay attention to, and how that helps them -- how that affects the decisions that they make and the beliefs that they hold about the world.

Over time -- especially now this is my third year introducing the tools of integrative thinking to a class -- and I think I've gotten better at it. But I also -- I listen to the conversations they have now in class, compared to, say, five years ago. And there's a world of difference. They'll -- they're such -- they're better communicators, they're better thinkers. And in terms of knowledge-building, that was another tool that changed my teaching practice because it's very much community-focused.

And I find all three of these things -- NPDL, tools of integrative thinking, knowledge-building -- are all very community-focused. So we don't just find out things in isolation. We build our knowledge and improve on ideas as a whole group. So, yes, with the particular inquiry I explained today, each group built knowledge in groups of three or four, but then we shared as a whole group. And maybe we started with one idea and then improved on that idea based on someone's -- what someone suggested. And I think the finding connections is huge. And seeing that a complex problem has so many

different causes and things that you can look at about it. But there's also a lot of interrelationships between those things.

For example, right now in class we're talking about what causes food costs to rise. We are looking at the high cost of groceries in northern Ontario. It started last week when we were doing a math assignment where students had to plan a week's worth of groceries. And we actually visited a grocery store, and they were researching prices, calculating the costs per person per meal. And they started asking questions like, "Why is meat so expensive?" "Why is organic food so expensive?" And then I showed them some images of cost of food in Nunavut, and their minds were blown. They couldn't believe that a case of water could cost \$100. Or orange juice would cost \$23. And to me, those are the points where I jump into knowledge building. I hear them asking questions about a topic, they're interested to learn more, and that's when I usually put up a knowledge-building wall. And I ask the question, "What do you want to know about this?" And students will go off in a variety of different areas. And part of what I like about knowledge building is we can all be looking at an overall topic, like food, but students can branch off to what interests them.

So yesterday one group was looking into organic food versus regular produce and what causes the cost to be so high. One group was looking at salaries in Nunavut, and if people make more money because costs are higher. And the social assistance programs that exist there. And other groups were investigating shipping costs and where food comes from, and what affects cost of shipping. One group was looking at the Canadian dollar and how that affects grocery prices. But then at the end of the period, when we all came back together and sat around our knowledge-building wall and looked at all the ideas that had been contributed, we were able to find a lot of connections between things. And students were sharing not only the information that they found most interesting, but also where they were going to do next -- what they were going to investigate next. And to me, the biggest piece of knowledge building is those connections. So we all have our own ideas based on our overall topic, but how can we connect those ideas together? And where can we improve upon those ideas?

When I was introduced to the 6 C's, I began looking at my tasks thinking, "Wow, this is very focused on citizenship and collaboration --" but how could I push that to the next level. Could I get the community piece in there? Could we do some character education surrounding this? And it just taught me to look at all of my tasks and think, "How can I take this to the next level? How can I push student's thinking further?"

The C that I was paying most attention to was citizenship because the question came out, Are people less healthy in Nunavut because they can't afford good food? And one

of the "a-ha!" moments for a pair of students was when they found about the -- I was thinking physical health, but they went off on mental health. And they said, "Do you know what the suicide rate is in Nunavut?" And, "Do you know that mental health issues are much more prevalent than they are here?" And it got me thinking that we could go off in that direction, and look at food insecurity. And build that empathy. Because most of these students do live in a very fortunate community where they don't feel those struggles.