

**Monday, May 7, or “The day that things went wrong (but not irredeemably so)”**

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This reflection is based on a Secondary 5 Cultural, Social and Technical (CST) Mathematics class which took place in the afternoon of Monday, May 7<sup>th</sup>, at the beginning of the third week of my field experience. To understand my intentional practice in that class, we must first briefly review what I had prepared and what happened earlier on Monday.

I had prepared a week-long course of lessons for my two Sec. 5 CST math classes. We were covering vote-counting methods (Plurality, Borda, Condorcet, and Elimination) and different electoral systems (Plurality by Riding and variations on Proportional Representation), and I had prepared some example problems to work on in class as well as a three-class project in which the students would design a ballot, vote with the best ballot to choose their favourite song for Prom, then compare the results using different systems. The project, not challenging from a mathematical perspective, was intended for the students to connect the abstract concepts presented in class with a concrete, real-life experience.

The morning class was from my perspective a failure. Monday morning, I discovered that my cooperating teacher was absent, so instead a supply teacher would be present while I taught. None of the students had done their assigned homework, so instead of correcting it quickly on the SmartBoard, I chose to have the students complete the work in class—each doing the whole assigned problem—before continuing with the correction and the lesson. Due to a mix of factors (the Monday morning timing, the presence of a substitute and student teacher, and the oppositional stance I took over the homework) the students employed nearly every strategy of resistance possible. Most of my time was spent urging the students to work, dealing with behavioural problems and in general presiding over the exact opposite atmosphere as I had hoped for in planning my lesson. In that class, we barely finished correcting the homework, and did not start the ballot-designing exercise. I ended the class by making the students copy out another problem, promising to pick it up for marks the next day.

I knew that many of the factors I described above would impact the afternoon class and determined to avoid the type of confrontation I had experienced earlier, while not ignoring the work I had previously assigned as homework. To do this, I made very intentional changes from the morning’s class.

In the afternoon class, rather than moving immediately into a confrontational discourse by blaming and lecturing about finishing work, I asked who had completed the work. Only one or two students had, so I explained calmly and without expressing judgement that we would be working on the problem in class before moving on; however, I had the students in each row of desks work on a different portion of the full problem in order to complete it much more quickly. While this did not achieve the full cooperation of the students, it certainly elicited a more positive response than I received from the morning class.

Despite my early efforts to establish a positive classroom environment by balancing the need to complete assigned work with a positive attitude, there were a few students in the class who stood out

as discipline problems. In particular, two female students sitting next to each other continually disrupted the class and stayed off task. I frequently visited their desks, sometimes reprimanding their behaviour and sometimes using proximity to prevent negative behaviour. At one point, one of the girls retorted to a reprimand by asking “Why you always picking on us?” I held my ground, responding calmly and firmly. In retrospect, separating those students would have been a useful strategy, though it may have caused an escalation in the authority struggle.

However, my efforts to maintain class discipline largely succeeded, and I spent most of the time the class was completing their unfinished homework moving around the classroom helping students understand and complete the math problem. Working one-on-one or in small student groups, I tried to tug out the conceptual connections in the problem, even if the student just wanted to know the procedure to solve it. To do this, I would sometimes respond to a student’s question by asking them to describe where they were in solving the problem, and what they thought needed to come next. A few times, I had a student with a good comprehension move to a nearby desk to help a struggling student. I encouraged students to work in groups to discuss and solve the problem.

After each of the rows had completed their portion of the larger problem, I returned to the front of the class to correct the problem on the board—an important step since each group had only completed a third of the problem. As I proceeded through the steps, I stopped at a few junctures to ask the class why we were doing the next step and how to do it properly. When a student answered, I paraphrased in slightly more academic language to indicate they were right and to familiarize the class with the mathematical vocabulary that CST students are not very comfortable with.

When we reached the portion of the problem solved by the second row, one of the students—who at the start of the class had been uncomfortable with the solution procedure—volunteered to demonstrate for the class, to which I agreed readily. She wrote her solution on the board without showing much work, so I asked her to explain one calculation to show how she obtained her final result. She did not have the confidence to demonstrate this to the class, so I decided to demonstrate myself, although in retrospect I think it may have been good to have another student join her at the front to help.

We finished the homework correction in time to complete the ballot design activity, which went fairly well. The students were not at first sure what they were designing, and were pleasantly surprised when they grasped the demands of the activity (one quizzically said, “But sir, there’s no math in this!”). By the end of class, all the students had designed a ballot with a partner that included a rank-order choice for starting prom song and a single choice for prom meal. I would use these later in the week as described above.

Through intentional practice I was able to take a difficult in-class situation and successfully complete my teaching objectives (and hopefully the students’ learning objectives). However, looking at the larger view of the week’s lessons, I still have a lot of improvement to do: though I completed the three-day project with both classes, we spent much more time than I hoped on the procedural aspects and had little time remaining for the more interesting ties to the broad areas of learning. I was also largely

focused on behavioural and disciplinary aspects of class on Monday, leaving less time to focus on helping students construct knowledge about the mathematics of the lesson. Fortunately this improved as the week went on, and I felt much more confident later in the week, even without my cooperating teacher present.

I will conclude with a thought that I have alluded to above about mathematics: it should be learned conceptually, not procedurally. The teacher should always aim to support students' conceptual understandings of math, however difficult this may be with students who have internalized years of struggling in math classes and have resorted to procedural memorization in order to pass tests. I have offered some strategies above appropriate to the context of solving a complex problem with the class—asking students to describe how they are solving the problem, having students work together to share knowledge, and paraphrasing student explanations in mathematical language—and there are other strategies appropriate for direct instruction or project work; however, the skill of promoting conceptual learning is one I will be developing throughout my educational career.