Math: Pie Charts and Truth

What if pie charts were about facing truth?

> *Brandon was teaching about pie charts and wanted his class to realize that information can be powerful and can challenge and change us. He did not want pie charts to be just a skill to be mastered and information students could remain detached from.*
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> *"I decided to change my approach for this lesson and include some history. I introduced the lesson by telling the story of Florence Nightingale and how she invented a form of pie chart. I explained that she was a competent mathematician (she was a fellow of the Royal Statistical Society), as well as a Christian and a nurse. She used her math skills to make a difference. I deliberately chose a faith example as this usually is not done in math and I wanted the class to see a Christian in a different role.*
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> *"I talked about Florence Nightingale's sense of failure after the Crimean War and how she used pie charts to show her findings about deaths in the military hospitals. The pie chart was designed to allow people to take in information easily and to be visually arresting, because she wanted the facts to speak for themselves and bring about change. Florence Nightingale did this even though the facts showed that the principle cause of death was poor sanitation, not inadequate food and supplies as she had thought. She was humble enough to face the facts and change the way she did things. Doing this also changed the ways hospitals were built.*
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> *"I asked the students to create pie charts that would be arresting and challenging, using information about water from the Internet. The information was for using on posters for school that might bring about changes in how we think about water and use it."*

http://www.wateraid.org/uk/learn_zone/homework/statistics/default.asp
http://ga.water.usgs.gov/edu/earthwherewater.html
http://www.keepbanderabeautiful.org/waterdata.html

What's going on here?

Brandon **saw** math skills as related to wider purposes and able to challenge and change us. He encouraged students to see math as capable of being used for positive change.

He **engaged** learners in experiencing a faith-related account (Nightingale) that would focus them outward on the purposes of math in the wider world. He had them reflect on the outcomes of how others have used math, and challenged them to respond by researching an issue needing attention today.

This led him to **reshape his practice** by using a storytelling approach to place the math skills in a different context (the account of Florence Nightingale and her use of pie charts), by changing the way he introduced the lesson (start with a story), and by choosing an activity that enabled students to respond (water facts).

How do I do this myself?

- Elementary example
- Secondary example

What does this have to do with faith, hope, and love?

This lesson encouraged the students to approach problems in the world with **hope** that change is possible. It reframed math content in terms of skills and tools that can be used in a way rooted in **love** for others and a willingness to change ourselves. Opening ourselves up to be changed in this way and hoping for positive change in the wider world are acts of trust. The lesson also helps to break down the sacred-secular divide and show that **faith** is relevant to math.

What difference does it make?

The way Brandon taught encouraged a change of attitude about information. He challenged the implicit idea that the purpose is to collect information in a detached way. This is an example of doing the same thing differently, as the maths skills did not change but the framework within which they were exercised did.

Where could we go from here?

Teachers can choose the content through which to demonstrate other skills and show their possible purposes too. Other themes and challenges that can utilize math also can be chosen. Not every mathematical process needs to be related to a service issue; it is more a case of looking at what larger story our choices tell about math over a period of time.

Digging deeper

If we think we are the one doing the mastering in a learning situation, we feel safe and in control. If we concede power to what is studied, we become vulnerable and allow information to challenge and change us. Vulnerability is a key attitude of Jesus in his ministry. By becoming one of us he became vulnerable, a position he maintained throughout his earthly life from the manger to the cross (Philippians 5:6-7).

Knowledge and knowing in the Bible are not just about collecting information, but rather involve learning for life. The words used for knowledge in the Bible include information, but they also cover personal relationships and experience, focusing on learning that makes a difference (Proverbs 1:5).

To accept no divide between sacred and secular means faith is integral to all subjects and all areas of life. It is seeing a whole subject differently, not just tacking something religious onto a basically secular subject. Exploring a subject from a Christian perspective might involve exploring the big issues, asking ethical and religious questions, and making connections across a range of areas. This holistic view of the world means that not only religious jobs are holy; engineering, accounting, parenting, and computing can all be "holy" jobs. In St. Augustine's language, all truth is God's truth for there is a deep interconnectedness in the world (Acts 17:28).

> *We are holy creatures living among other holy creatures in a world that is holy. Wendell Berry*

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