Selling Mathematics: Service & Quality

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Synopsis

Is there a difference between teaching mathematics and selling mathematics? The author presents his personal experience on the topic and reflects on how this perspective can be used to improve public perception of and engagement with mathematics.

Sales was a natural part of my family. My father owned and operated The Sun Valley Lumber Company, after taking it over from his father who started the business in the early 50s. Sun Valley's motto was "Service and Quality," with a focus on the best customer service and the highest quality products. For example, we sold Benjamin Moore paints – a little more expensive, but ultimately worth it for the quality and lasting product. If you came in to buy some pine board for a shelving unit, we might suggest you consider a nice hardwood instead that, though a little more expensive, would make a superior quality product. I grew up in this working environment and was looking forward to a sales career at the lumber yard once I graduated from high school. In preparation, I took on many jobs from delivering the local newspaper to working at the local pizza parlor. All of these opportunities gave me lots of experience with sales, and I loved it! I was proud to use the term "salesman," which to me meant an expert selling a quality product with the utmost attention to the customer's needs.

Meanwhile, back in high school, I was falling more and more in love with my math classes, although I noticed many of my friends were having difficulties and starting to tune out. As they struggled with their homework, I enjoyed explaining the concepts to them, and they would often respond positively ("why didn't the teacher explain it that way?"). To me, it was a matter of sales – I knew the product was good, and I was energized by the thought of having to convince my "customer" the same. Unfortunately,
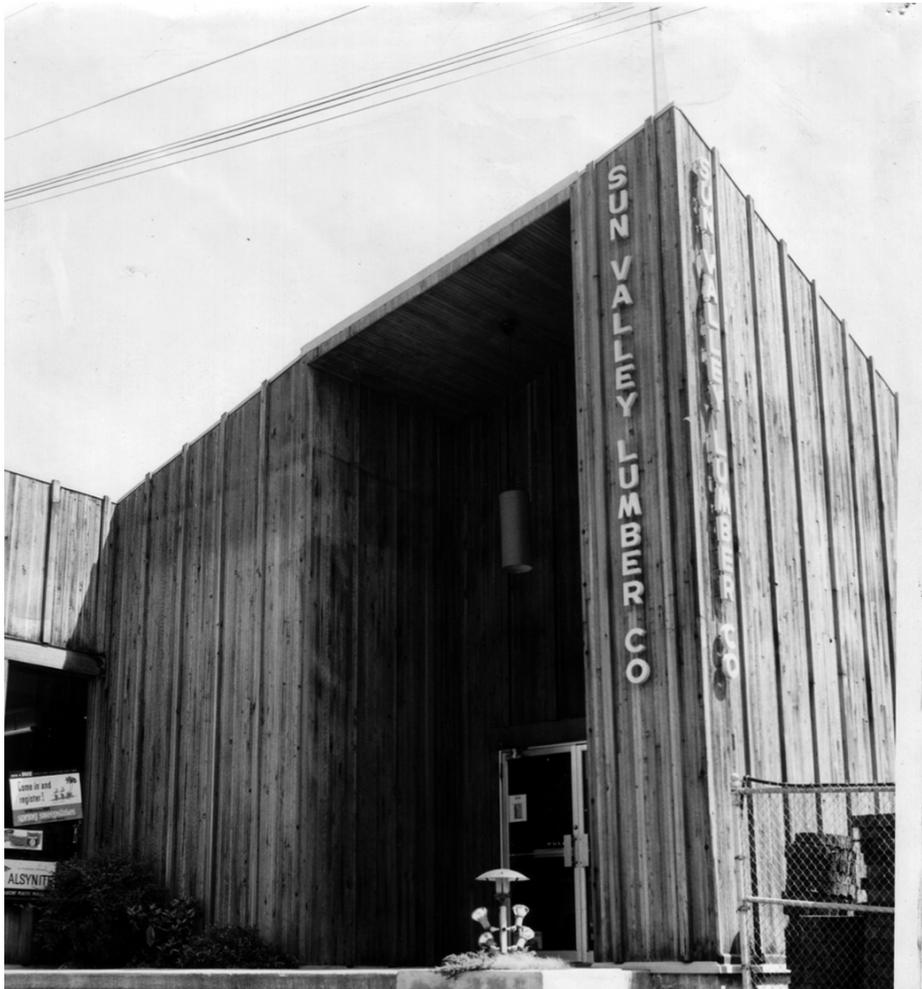
Figure 1: Sun Valley Lumber main entrance (circa 1960s, from the author's family photo collection).

during this time, the recession of the early 90s coupled with the growth of big-chain hardware stores drove our "ma and pa" operation out of business and I unexpectedly had to come up with a new career plan. Inspired by an excellent high school teacher and my positive experiences "selling mathematics," I realized I was destined to become a *math salesman*!

One of my favorite techniques for selling math is finding a way to connect the idea directly to the customer. A textbook's lamppost or ladder might become a surfboard or mic stand, a cylinder becomes a tom-tom or a vat

of beer, a circle wedge is a guitar pick or a slice of pizza, and so on. Along these lines, when introducing functions I was fond of using "Rockford" for the argument, paying homage to the classic TV show. If $f(x) = x^2$ what is $f(\text{Rockford})$? Of course, $f(\text{Rockford}) = (\text{Rockford})^2$. This simple, but unexpected, example would solidify in students' minds why $f(x + h) = (x + h)^2$ instead of $x^2 + h$ or some other expression. However, students eventually became distracted by my Rockford example. Jim Rockford had long faded from their cultural consciousness, leaving only a few students to think that it might be a reference to Rockford, Illinois, or perhaps a salad dressing – the distraction outweighed the technique. Meanwhile, the show South Park was becoming quite popular, so I switched my example to $f(\text{Kenny})$, in honor of the show's character (who seemed to die in every episode), and once again the technique worked like a charm. I learned my lesson – make it relevant to *their* life and bring a little of their world into my sales repertoire. After all, customers like products they can relate to and that fit in their self-image. Unfortunately, this is a longstanding problem in mathematics – young people have a hard time fitting math into their self-image, and we need to continue to do more to address this PR problem.

Another essential technique for selling mathematics is enthusiasm! My colleague Mike Orrison once commented with regard to his teaching, "a little bit of enthusiasm – even if feigned – goes a long way." While said tongue-in-cheek, we all know the truth of this. A good salesperson is always excited and enthusiastic about their product. Let's face it: we're not always selling the most thrilling material. I have nothing against algebra and there is a certain satisfaction to be taken in applying logical algebraic manipulations to "solve for x" or whatever the task is, but that's not why we love mathematics. It's like selling nails – they're great little fastening agents with intriguing properties, but it's what you can build with them that's really exciting. We can enthusiastically sell nails because we know and appreciate their properties, what they're capable of holding together, and what great things they can be used to build. Similarly, we can enthusiastically sell algebra because we appreciate the subject's intrinsic properties and know what great things one can build from that structure and framework.

Do we really need to *sell* mathematics? Yes! It ties back to our persistent PR problem. Our students have limited time and attention to invest, and in their busy, fragmented world, the quick calculator or Wolfram Alpha calculation may seem sufficient for their purposes and come at a minimal cost.

When used correctly, these "pine board" calculators will do just fine, but they're not all-purpose and they're often used incorrectly. Ultimately, this growing innumeracy and fear of math will continue to burden our nation with citizens increasingly incapable of applying basic mathematical reasoning to important societal issues such as health care, tax policies, voting procedures, mortgage and credit banking policies, and so on. We need to sell mathematics and convince students of the importance of sticking with it and investing the extra time for the superior product. Yes, math is hard, but so is learning to play an instrument, mastering Starcraft, learning a new language, making a movie, reading Shakespeare, etc. Just as it may take effort to convince the customer of the benefits of the hardwood and justify the extra cost, we need to continue to invest time and energy educating young people about the benefits and importance of mathematics. We need to value learning mathematics and the associated hard work, just as we value quality products and the associated craftsmanship.

I'll bet if you think about some of the "best" teachers you've had or known, they are natural salespeople with a knack for convincing others of the beauty and importance of their subject and why one might want to invest their time for such a quality product. For mathematicians, it's not like we're selling Ginsu knives (but wait, there's more!) – we're selling the language the book of the universe was written in – it's a quality product! Sometimes we're selling the most beautiful math in the world, other times it's a little more subdued, or even mundane, but it's math and that's always a good sell. To be clear, there are many ways to sell mathematics – some prefer to let the customers explore the product and see for themselves, other prefer to demo some of the many great things the product can do. Whatever your sales style, I encourages you to continue in the Sun Valley tradition and teach mathematics with "Service and Quality."