The Future – Part IV by Todd Frauenholtz

I have written a few brief notes here in MathBits encouraging my math teacher friends to work on recruiting future teachers because I am concerned about the national teacher shortage in mathematics. Toward that end, I requested annual data on the number of secondary mathematics teaching licenses issued in MN from the Professional Education Licensing and Standards Board (PELSB).

I have read data from at the national level and wanted to see if our own Minnesota data would show a different trend here at home. The PELSB staff member reminded me they were formerly known as the Board of Teaching (BOT) and the tiered licensing system we now know has not existed very long here in Minnesota. Because of this, their data pre-2018 were archived in hard copy reports and would be more difficult to access; however, more recent data are in their current data base and easier to access. They did their best and provided me the following data set:

year	license area		total	MN Grads Total
1999-2000	Mathematics		289	149
2004-2005	Mathematics		508	383
2009-2010	Mathematics		469	337
2014-2015	Mathematics		322	197
			Tier 3	
2019-2020	Mathematics		146	102
2020-2021	Mathematics		195	153
2021-2022	Mathematics		170	128
2022-2023	Mathematics		192	152

They had additional data regarding Tier 1 & Tier 2 licenses, which may not have significant content knowledge so they did not seem comparable to our Tier 3 licenses. They also included Tier 4 license data, but these too are not comparable with the licenses issued to new teachers because they require several years of successful teaching experience. The column of MN Grads represents students who graduated from a college in Minnesota compared to someone who went to college out of state and moved to Minnesota for their teaching job. These people are included in the number of overall licenses, thus for 2023 we can see 40 teachers did their math teacher preparation at a college outside Minnesota.

Now the math question – are the number of people entering the mathematics teaching profession in Minnesota really declining? 2005 was the year with the highest number of licenses, but according to the box and whisker plot on my trusty old TI-83+ graphing calculator it is not an outlier. Visually looking at the scatter plot I feel like there is a negative slope in there somewhere (getting my straight-line spaghetti noodle out now - a fun memory for my overhead projector comrades)! When I try to create a linear regression model the slope is negative, but the r-squared value tells me this model does not fit the data well.

I encourage you to put your quantitative brain to the task of analyzing the data and determining the significance of the math teacher shortage heading our way. If you see the same trend I am noticing then I hope you will take action and look for those math students who would enjoy a career as a future teacher, then encourage them to get the credentials and have an amazing career!