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The Vicious Cycle of Science Teacher Preparation

My Vexation:

Why, in a time when the opportunities to teach junior high and high school science outweigh the number of students desiring to become science teachers, are we having such a hard time finding students who want to become teachers?

The reports from local to national news media, research findings, *Nation at Risk*, *A Rising Storm*, and many other publications seem to preach of the doom of our nation if we don't raise our scientific literacy and proficiency as a nation. It seems that the public interest is in having good schools, in teaching science, reading, math, writing and other courses. Yet when a school, even a state, tries to increase the number of math and science courses a student needs to take to graduate the outcry is deafening. The weeping and wailing of the poor public that feels that their non-math/science student is being picked on for having to take an extra year of math and science in the four years they attend high school drips from the cracks of the extra programs and electives that schools offer.

If we don't educate a scientifically literate and proficient population it seems that we are always going to have a hard time finding enough talented students who want to enter the education profession. If students don't see a need for science when they are in school why would they have a desire to be a science teacher when they leave school?

It seems that we have enough English teachers. (I think it is almost required to take it every year you are in school.) Do you spell "I" "i" or must you say capital "I" -- the word I went out on in my seventh grade spelling bee. History seems to have a lock on most years you are in secondary school. I could go on and on yet it is true in many states that in 9th-12th grade all that is required is two science courses. In Utah it is two and most students take one in 9th grade and the State of Utah even lets one science class come from technology. It is of great wonder to me that we are producing any science teachers at all.

So my vexation is this: How can we possibly raise the number of science courses taught in public schools if we cannot even fill the number of opening we have now have with qualified science teachers? If we don't raise the number of science course offered in the schools how will we ever find enough students that want to become science educators?

If Utah does increase the number of science courses students need to graduate, who will teach the courses, and what will they be called? Will the Science community even be able to provide enough teachers for this venture? Will the teachers that are provided be prepared to teach science? Will the classes that are offered be "science" or some other course that can now give "science" credit?

My Venture

The vexation of needing more qualified secondary science teachers along with needing more required science coursed in the secondary schools is way easier to whine about than it is to solve.

Something that I have noticed in Utah:

The legislature will put pressure on the State School Board to have more science taught.

The State School Board will go through the process of saying it will require more science.

The question will be when the weeping and wailing parents and teachers of our extra curricular, elective courses show up on the steps of the State Capital will the State School Board and Legislature stand up for what they are proposing? Will the State and the Legislature stand up for more math and

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science or will the normal process occur that the people who show up to weep and wail win because they show up to protest?

A possible outcome for many if the State does choose to uphold adding Math and Science credits is to find a way to give students an extra class every year for four years by using block schedules.

Now the debate changes: Do you want to see your students every day for 50 minutes or every other day for 90 minutes? In doing the math you see that 10 minutes are lost every other day for the school year on the block schedule. The school made room for the extra period and parents and students of the elective classes keep their programs and over 4 years of high school students lost 3600 minutes of science instruction they could have had on the old schedule. That works out to losing 72 days of instruction during four years of any subject, English, Math or Science. But for the elective class it meant that if they only needed one more math and one more science they actually gained two more elective classes so they gained the amount of instruction time and math and science lost again. I know that some students will take more math and science but my argument is that they take more anyway. Again we are not affecting the literacy and proficiency of all the students in science.

Finally, we cannot ask for more science courses when we are not preparing more science teachers. We will have a hard time preparing more science teachers if we don't do something to help more students find science in the secondary schools more interesting and exciting. Teachers play an enormous role in the attitudes of the science student. If we are not putting excellent teachers trained in science content and pedagogy for teaching students science we will be continue to revolve around this circle.

We can be involved in outreach to the public school teachers to help them develop and become better science teachers. We can listen to the public school teachers and glean from them ways to better prepare secondary science teachers. In a partnership with the public school science teachers and university science preparation programs we can tackle many of the problems. Yet until more students develop that love for science in the secondary schools I don't see science teaching students numbers growing to meet the needs of the public schools with exciting well prepared teacher of science.

My Venture, then, has now become a list of questions that I need to pursue:

- ? Do we have examples of science preparation programs that use public school teachers as a resource and advisory board for teacher preparation?
- ? What effect if any does training crossover teachers have in creating good high quality science teachers?
- ? In the day of alternative licensure are there any reports that show if it is a option for preparing high quality science teachers?
- ? What role does professional development provided by State Office of Education contribute to high quality teachers?
- ? What role do universities take in the solution of this problem?
- ? What if any funds are available to prepare more and higher quality science teachers?
- ? How do we recruit excellent science students to become excellent science teachers in our secondary schools?
- ? Are the secondary schools too late to recruit these teachers? Is the quality of elementary school science education where we must start?