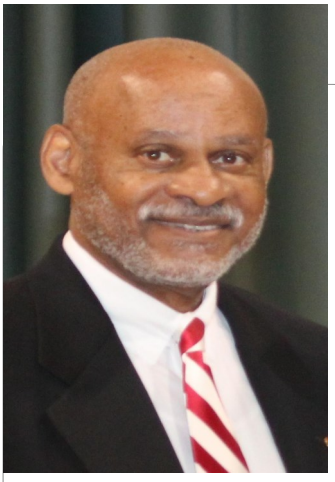

Lawrence King, Editor

Special points of interest:

- Underfunding Challenge
- Recruitment Challenge
- A Teachers Viewpoint

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STEM NEWS SPECIAL

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Underfunded Teaching Challenge

Teaching STEM subjects can be a particular challenge in underfunded schools with increasingly diverse student populations, whether urban or rural.

We are presenting in this special edition, a capsule of contributed articles and research that can help with perspective and focus on the issue.

Readers are encouraged to continue providing information that may be shared with our colleagues across the nation and abroad.

Poorest Students Often Miss Out on Gifted Classes

What does it take to find the country's most promising, academically talented students? In wealthier enclaves, where gifted education programs often flourish, it can be simply a matter of testing to cream the best from a pool of youngsters who have had high-quality early enrichment and academics. But with more than half of public school students across the nation are minorities and coming from low-income families and deepening concentrations of poverty in many communities, standard screening and pullout programs may not be enough to find and support the most vulnerable talented students.

Few states require teachers to have any training in educating gifted students, and none requires educators to learn about how poverty may affect giftedness.

In a school filled with students living in poverty, teachers and administrators may not have time or financial resources for advanced enrichment when other students need help to meet basic standards. Meanwhile, a poor, bright student in a wealthier school with the resources to support advanced courses and enrichment for gifted students may still find him- or herself outcompeted for a program slot by students who had more home support.

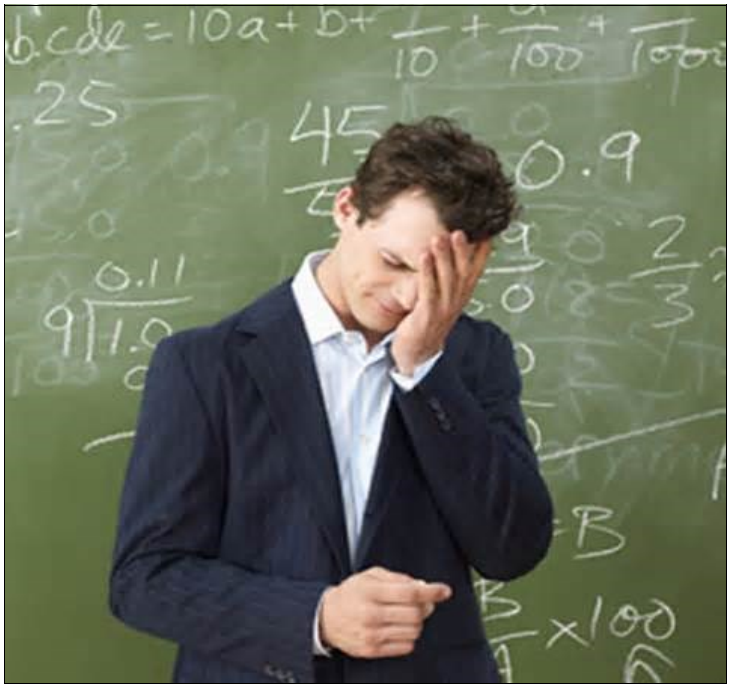
Recruiting Teacher to Poor and Under Resourced School Districts

Financial incentives to entice teachers to teach in schools where they are most needed have great intuitive appeal But the U.S. has long known: they may not work. At least that's been the experience in 30 states that have offered what is sometimes called combat pay.

Despite the argument that education is no different than other fields of work, the incentives that shape human behavior elsewhere have proven to be ineffective. Teachers are more interested in working conditions, administrative support and student discipline than in higher salaries. But even if teachers can initially be recruited to hard-to-staff schools, they do not stay. This turnover costs schools between $1 billion and $2.2 billion annually, according to the **Alliance for Excellent Education.**

Minority teachers quit at a far higher rate than white teachers, calling into question the belief that minority students respond best to teachers of their own ethnicity. If that were the case, schools with a preponderance of minority students would be coveted by minority teachers. But they remain undesirable. To address the recruitment-retention problem, states have tried various strategies. In California, teachers who are certified by the National Board for Professional Teaching Standards are eligible for a $20,000 bonus if they agree to teach in a high-priority school for four years. To date, the program's success is undetermined.

Massachusetts in 1999 began offering new teachers $20,000 bonuses. But one-fifth of them left after one year in the classroom in "tough schools". Mississippi has had better luck through a combination of college scholarships and housing assistance programs. According to the state's student- and teacher-information system, 254 of the original 332 teachers who completed the Critical Needs Teacher Scholarship Program since it began in 1998 are still in the classroom.



Recognizing the limitations of combat pay alone, the Milken Family Foundation launched an innovative four-part program that included multiple career paths, ongoing school-based professional development, evaluations linked to student performance and performance-based compensation. This multi-faceted approach has greater appeal to date to teachers than higher salaries. It's important to remember in the midst of the debate that although teachers are the most important in-school factor in learning, they are not miracle workers.

Students bring issues of hunger, violence, and lack of parenting to school through no fault of their own. No amount of money in the world can change that reality.

Just for Teachers

"What all good teachers have in common, however, is that they set high standards for their students and do not settle for anything less."

— Marva Collins, *Marva Collins' Way: Updated*

Who Has the Most to Win?

A look at the Urban Schools through the Eyes of a Former Teacher

During the 1960's and 1970's when I was a student in the Detroit Public Schools, often you would hear the term **inner city** used to describe the location of some schools in the district. This term had ended by the time I started my career in the late 1970's. Surely this term was used due to the economic hardship and racial makeup of the city and its schools. (Most schools and their students were poor.) Many people would ask me why I chose to teach in Detroit, since my student teaching was done in a rich private school. The answer was simple. I was called to teach at the age of seventeen to children who looked like me.

Having had the experience of teaching the upper middle class and poor, it is most rewarding to teach those with less. Less money, resources, parent support, food, clothes, and I could go on and on. When I was a 7th grade student, our English books had not arrived until weeks after the beginning of the school year. Mrs. Jenkins taught the class without books and did it well; we were the honors English class. The lack of books taught me that a good teacher should be so well trained, that a book for each student was not necessary. It was all about creativity and strong knowledge of the subject area of that teacher. For me, this was fun, powerful, and challenging as a teacher when the tables were turned.

The Urban classroom might not have all the **STUFF**, but we make up for this with the creativity of not only the teacher, but the students as well. The most powerful element is **socialization.** In public poor districts we take all students. Some are gifted, some have special needs, many have family problems which run into the classroom, and some just don't give a damn. When placed together, we make-up the typical classroom in America. No matter what their needs and strengths might be, they help each other to learn by not even knowing they are helping.

JoAnn Y King

Once in my middle school classroom a deaf student was placed in my homeroom. He came with an outstanding interpreter. His first months as a student were hard for him due to the lack of hearing and just being a grade level behind. What he did have were two deaf caring parents, teachers who treated him like his classmates by making him work hard, and classmates who worked and loved him regardless. (Being a good baller, dancer, and cute didn't hurt.) The greatest achievement of all was his classmates learning to sign within a few months. His teachers were a little slower. Today, two of his former classmates are educators and sign as a part time job, and he is a productive taxpaying citizen in Michigan.

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RAISING THE BAR

With increasing cultural and linguistic diversity in classrooms across America, and achievement gaps persisting, teachers need to remain vigilant to employ practices that reach all their students in order to level the playing field. As students from poor and non-mainstream backgrounds receive equitable learning chances, they are just as capable of attaining science and math outcomes comparable to their peers.

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Teachers Eyes Continued

Urban children learn survival skills, and must learn to be strong. There often is no one to clean up their mistakes which all children make. Their dialect might be different from the non-urban student, but they are socialized and gifted more than what is reported.

One might wonder why their test grades are not as strong according to the state mandates and why more are not in the gifted and talented programs. Surely I am biased, but allow me to make this uncomfortable statement. Politically, socially, and economically it is unacceptable to those who control the dollars and its people in this country, who made a conscious decision to place tax dollars into prisons and not public schools in the urban areas, to care for support positive programming in these schools.

Even though this is a 24/7 argument, allow me to step out of this for now and end with this. If education was fair in its funding by spending monies on developing socially fair state achievement tests, placing monies in the arts (the Greeks said to develop the whole man) and taking the time to spread positive propaganda of its children and schools, the people of this country could be bigger winners.

Who has the most to win? **Society.**

Jo-Ann Y. King, retired Detroit Public Schools

Usage of Simulations in Teaching

As a chemistry teacher, there are often items that we must teach in our standards which many students find very abstract and confusing. Some of these things are those that are at the submicroscopic level. These things cannot be visibly seen in the high school classroom – they can only be seen with the aid of a scanning electron microscope. Other items are those which students may need visual example to be able to concretely understand.

One way in which I have been able to provide these examples to my students is through the usage of technology via simulation through websites such as phet.colorado.edu which is ran through the University of Colorado and the Chemical Education Research Group (CERG) lead by Tom Greenbowe at Iowa State University. STEM NEWS is one asset that helps provide a frame of reference for educators like me who are broadening their knowledge in teaching science.

STEM News is a good resource for science educators to showcase effective approaches and techniques that excite and engage learners for tomorrow's economy.

Erica Peddi, Chemistry Teacher—Campbell HS, CCSD