How might we raise the prestige of the STEM teaching profession?

TEACHING LACKS FINANCIAL INCENTIVES.

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01 CONTEXT AND TRENDS

The demand for science, technology, engineering, and mathematics (STEM) skills in the private and public sector is high, and the shortages of qualified job applicants have been documented (Free, 2016; Burning Glass Technologies, 2014). In this cross-sector market of high demand and short supply, the public school systems suffer significantly. STEM jobs outside of the education realm often pay a premium (Free, 2016; Burning Glass Technologies, 2014; National Association of Colleges and Employers, 2016), with an average wage in 2013 of $79,640 (Jones, 2014). College students with STEM interests are well aware that they can make more money in nonteaching careers, thereby challenging districts', schools', and teacher prep programs' abilities to attract graduates with STEM expertise and training (Burke & McNeill, 2011; Rothstein & Rouse, 2007).

Even with the ever-increasing push for highly qualified teachers to raise student achievement, particularly in shortage areas like STEM, the monetary incentives for recruiting and retaining such teachers is nothing but dismal. Teachers have significantly lower starting salaries compared to starting salaries in other STEM careers. Lack of performance bonuses and the burden of student debt further discourages college students from becoming teachers, knowing the low future income potential (Business-Higher Education Forum, 2007; Rothstein & Rouse, 2007).

02 DISCUSSION

Burning Glass Technologies (2014), a labor market analytics firm, examined job postings for the year 2013. According to these data, there were 2.5 job openings for every four-year STEM graduate, compared to 1.1 job openings for every graduate in non-STEM fields. This emphasizes the multitude of opportunities for STEM graduates in the job market, making it harder to recruit teachers in STEM areas for what is often a lower salary. The average advertised salary for entry-level noneducation STEM jobs that required a bachelor's degree was $66,123 (Burning Glass Technologies, 2014). The average starting teacher's salary, in comparison, was $36,141 for the 2012–2013 school year (National Education Association, n.d.).

Almost 90 percent of U.S. public school districts have a one-size-fits-all salary schedule that pays all certificated teachers based on experience and additional graduate education hours, regardless of content area (Goldhaber, Krieg, Theobold, & Brown, 2015; Yaffe,

2016). Christopher Koch, president of the Council for the Accreditation of Educator Preparation (CAEP), the accrediting body of teacher-education programs, suggested altering the salary schedule to offer increased pay for high-need areas, such as STEM (Goldhaber et al., 2015). A few school districts have implemented this approach; however, many have faced opposition or been blocked from altering the salary schedule due to collective bargaining units (Yaffe, 2016; Azordegan, Byrnett, Campbell, Greenman, & Coulter, 2005).

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Moreover, the National Education Association states that the average teacher salary actually fell 4 percent in inflation-adjusted dollars between 2004 and 2014 (as cited in Yaffe, 2016). With teacher salaries dropping and costs for higher education rising, college graduates are hard-pressed to purposefully choose education as a career. According to College Board, the cost of tuition, fees, room, and board increased 129 percent for public higher education between the years 1983 and 2013, and student debt increased by 92 percent since 2004 (Free, 2016).

Within this context of high college costs, rising student debt, relatively low starting salaries in education careers, and little promise of significant salary increases, what are the possibilities of improving the recruitment and retention of highly qualified STEM teachers? According to Watt, Richardson, and Pietsch (2007), “without well-educated teachers capable of drawing children and adolescents into a fascination with STEM fields, there will be little chance of sustaining the numbers [of STEM teacher candidates] who remain in the pipeline” (p 796).

03 BRIGHT SPOTS

Despite the notable challenges discussed above, some states and districts are developing a stronger STEM teacher workforce through targeted efforts to make teaching careers more attractive. North Carolina school districts offered a $1,800 bonus for certified mathematics, science, and special education teachers. This resulted in a reduction in turnover by 17 percent in the short term (Goldhaber et al., 2015; Clotfelter, Glennie, Ladd, & Vigdor, 2008). Tacoma Public Schools in Washington state offer a bonus to new staff and an additional bonus for those who are teaching in high-need areas, including the STEM subjects. As another example, the state of Georgia has implemented a salary schedule advancement policy for teachers in mathematics and science that is different than the policy for teachers of other content areas (Goldhaber et al., 2015; Education Commission of the States, 2008). Similarly, in 2008–2009, Utah implemented a salary supplement for high-need teaching positions (Education Commission of the States, 2008).

Additional perks or bonuses are sometimes offered to new teachers to help combat the relative low salary. These include location bonuses and subsidized housing (Yaffe, 2016). In Connecticut, mortgage companies offer a lower interest rate for certified teachers who teach in high-need areas. Likewise, Illinois has directed the state housing authority to provide assistance for down payments on housing loans for teachers who teach in hard-to-staff schools or hard-to-staff positions (Education Commission of the States, 2008).

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Student loan forgiveness programs for teachers who take positions in high-need areas and teach in qualified school districts (typically low-income and/or low-performing school districts) for at least five years are other strategies for improving teacher recruitment and retention (Federal Student Aid, 2015; Goldhaber et al., 2015). In addition, some districts are offering nonmonetary perks, such as extra prep time or flexible leave policies (Goldhaber et al., 2015).

Pay for performance has been recommended as another opportunity to recruit and retain high-quality teachers, as well as bonuses for teachers who recruit and enroll more students in Advanced Placement (AP) classes and whose students demonstrate high pass rates (Burke & McNeill, 2011). Florida, for example, offers $50 bonuses (up to $2,000) to AP teachers for each student who passes the AP exam.

04 CONCLUSION

Richard Ingersoll, professor of education and sociology at the University of Pennsylvania's Graduate School of Education, states, "[W]ell-paid, well-treated, well-respected lines of work do not have shortages" (Yaffe, 2016, p. 15). The teaching profession is suffering a public relations nightmare, which leads to the perception of a second-rate career opportunity. Quality public education needs to become a priority in the minds of policymakers, a profession worthy of the impact it has on children. This would be an effective approach to increasing the number of highly qualified teachers in the classroom.

ABOUT THE GRAND CHALLENGES WHITE PAPERS

In 2017, 100Kin10 released an unprecedented representation of the big, systemic challenges to preparing and supporting STEM teachers following over two years of extensive research alongside more than 1,500 STEM teachers and hundreds of other education experts. As a part of this work, 100Kin10 commissioned a series of short white papers from well-versed thinkers and practice-oriented researchers to synthesize the most relevant research around the specific challenge areas. Together, they compose a thoughtful and well-rounded examination of the systemic challenges currently facing STEM teaching.

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