In 2008, the Washington State Legislature passed ESHB 2687 which directed the Professional Educator Standards Board (PESB) to conduct “a comprehensive analysis of math and science teacher supply and demand…”\(^1\)

Among other tasks, the Legislature directed the PESB, in collaboration with the Washington State Institute for Public Policy (Institute), to “provide information from a study of differential pay for teachers in high-demand subject areas such as mathematics and science, including the design, successes, and limitations of differential pay programs in other states.”\(^2\)

Finding. We reviewed the national research literature on whether differential pay for teachers in math, science, or other high-demand teaching fields affects whether new teachers are attracted to the profession, or whether the attrition rate of existing teachers is reduced. Unfortunately, existing research on this specific topic is too thin to draw conclusions. To date, there have been very few attempts to offer differential pay and, as a result, evaluation evidence is sparse.

Lacking this research base, we examined a broader question that can shed some light on the topic of differential pay. We reviewed studies that have analyzed how salary increases—for all teachers—affect the degree to which teachers leave the profession.

We found nine credible studies that have looked at this question. We draw two general findings from this body of research. First, higher teacher salaries do reduce attrition rates; all nine studies demonstrated this effect. Second, the magnitude of the effect can be summarized as: a 10 percent increase in teacher salaries leads to a two-to-three percent decrease in teacher attrition rates.

It is important to note that these findings apply to all teachers, not specifically to those in math, science, or other high-demand fields.

\(^1\) ESHB 2687, Chapter 329, §501 (w), Laws of 2008
\(^2\) Ibid, §501 (w)(iv).

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REPORT TO THE PROFESSIONAL EDUCATOR STANDARDS BOARD:
Differential Pay for Teachers in High-Demand Subject Areas

Background

This report summarizes findings on research conducted by the Institute on differential pay for mathematics and science teachers. Broadly speaking, differential pay refers to pay policies by which certain groups of teachers are paid more based on their knowledge and skills in particular subject areas. Calls for subject-area pay incentives have emanated from the shortages faced by most schools for well-trained and adequate numbers of teachers in shortage subject areas, mostly mathematics, science, and special education.

Any research into differential pay policies for teachers recognizes that schools must compete in labor markets for the technical skills associated with mathematics and science training. The rationale for differential pay policies is, therefore, the realization that “individuals with different attributes face different financial opportunity costs to enter the teacher labor market.”\(^3\)

The Earnings Gap

Recent research has revealed that there is a difference between what math and science teachers are paid and what professionals in comparable occupations earn. The size of this gap has recently been presented to the Joint Basic Education Task Force by Lori Taylor,\(^4\) who found that, on average, mathematics and science teachers in Washington State earn $54,568 while comparable professionals outside of the teaching profession earn $76,199.\(^5\) Goldhaber (2008) found that teachers with technical


\(^5\) The $76,199 estimate from Dr. Taylor assumes a full 12-month work year; if teachers work 11 months in a year, this figure reduces to $69,849, and if teachers work 10 months in a year, the comparable wage estimate reduces further to $63,499.
degrees—particularly in mathematics and science-related fields—begin their careers earning average salaries that are comparable to those of individuals with the same degrees but who have non-teaching careers.\(^6\) He also found, however, that as individuals gain more experience in the labor market, an earnings gap emerges between teacher and non-teacher salaries, which on average can be as high as $27,890 per year after 10 years of employment experience.\(^7\)

**Differential Pay Programs: Evidence From Other States**

The key goal of this research was to identify the impact of differential pay policies for mathematics and science teachers on the ability of schools to enhance the recruitment and retention of teachers. We briefly document the states in which differential pay programs exist and what the outcomes of the programs are to date.

Currently, four states provide pay incentives for teachers willing to teach in hard-to-staff subject areas like mathematics, science, and special education. These states are California, Alaska, Louisiana, and New York. Additionally, some school districts provide supplemental pay for hard-to-staff subject areas, including Houston ($5,000), Los Angeles ($5,000), and New York ($3,400).\(^8\)

By 2006, California was funding two incentive programs that awarded pecuniary benefits to teachers accepting assignments in high-need subjects. These incentives are provided on a graduated basis as a teacher completes subsequent years of teaching. Due to the limited number of evaluations from these programs, findings on their successes and challenges are preliminary. While some success has been observed in terms of teacher retention, incentive pay programs appear to face significant challenges, the most common of these being implementation errors, teacher targeting difficulties, and a lack of well-developed data sets that can be used to evaluate the impact of the program.\(^9\)

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\(^7\) In comparison, for individuals with non-technical degrees, the average differential after ten years is estimated to be $18,904. Goldhaber, 2006, p. 8.

\(^8\) Goldhaber, 2006, p. 16.

The attrition elasticity of each study in Exhibit 1 indicates that the magnitudes are all negative. This is interpreted to mean that a 10 percent increase in teacher salary has the impact of reducing attrition by a magnitude that ranges from -.346 to -14.35 percent. Averaged across all nine studies, a 10 percent increase in teacher salary corresponds to a reduction in teacher attrition by 2.3 percent. It is important to note that each of the magnitudes represents the responsiveness of average teacher attrition/retention to a general salary increase. They may or may not apply specifically to math or science teachers, but the estimate does provide a general insight into the workings of teacher labor markets.
Citations


For further information, contact Irene Ngugi at (360) 586-9436 or Irene@wsipp.wa.gov.