

The Relationship of Pay to Job Attraction, Job Loyalty, and Performance for High Quality STEM Teachers

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Abstract

Improvement in the quality of education in science, technology, engineering and mathematics is vital to global competitiveness. The need for more effective schools and the centrality of the teacher's role in any substantive school improvement plans are well known. Educators, political factions, and policy-makers are engaged in a lively debate as to whether performance pay schemes or more substantial increments across the salary schedule are more likely to motivate teachers to boost student learning outcomes. Neither side questions that some type of financial incentive is necessary for robust results. Since the economy has made local districts less able to provide either type of financial incentive, this study examines whether expensive pay-related motivators are as essential as the current discussion would suggest. It finds that virtually cost-free motivators such as positional respect, positive working environment, personal meaning, job security, and positive challenge may each be more effective in attracting, retaining, and inspiring quality teachers than any restructuring or improvement of financial compensation.

Keywords:

administration; education; personnel; technology.

A relação entre o salário e a atracção pelo trabalho, lealdade ao trabalho e desempenho no trabalho dos professores de Ciência, Tecnologia, Engenharia e Matemática de alta qualidade

Resumo: Melhorar a qualidade da educação em ciência, tecnologia, engenharia e matemática é vital para a competitividade global. A necessidade de escolas mais eficazes e a centralidade do papel do professor em quaisquer planos de melhoria substancial da escola são bem conhecidos. Educadores, facções políticas e decisores políticos estão envolvidos num intenso debate sobre se são os sistemas de remuneração por desempenho ou aumentos substanciais em toda a tabela salarial que são mais susceptíveis de motivar os professores para melhorar os resultados da aprendizagem dos alunos. Nenhum dos lados questiona que algum tipo de incentivo financeiro é necessário para obter resultados robustos. Uma vez que a economia tem tornado as autarquias locais menos capazes de fornecer qualquer destes tipos de incentivo financeiro, este estudo procura examinar se os dispendiosos factores de motivação salariais são tão essenciais como parece sugerir este debate. Mostra-se que factores de motivação virtualmente livre de custos, tais como respeito profissional, ambiente de trabalho positivo, realização pessoal, segurança no trabalho e desafio positivo, podem ser mais eficazes para atrair, reter e inspirar professores de qualidade do que qualquer reestruturação ou melhoria de compensação financeira.

Palavras-chave: administração; educação; pessoal; tecnologia

La relation entre le salaire et l'attraction pour le travail, la loyauté au travail et le rendement au travail des enseignants de sciences, technologie, ingénierie et mathématique de haute qualité

Résumé: Amélioration de la qualité de l'éducation en science, technologie, ingénierie et mathématiques est vitale à la compétitivité mondiale. La nécessité des écoles plus efficaces et la centralité du rôle de l'enseignant dans quelques plans de fond d'amélioration des écoles sont bien connues. Les éducateurs, les factions politiques et les décideurs politiques sont engagés dans un vif débat quant à savoir si les régimes de rémunération au rendement ou incréments substantiels dans l'échelle des salaires sont plus susceptibles de motiver les enseignants à améliorer les résultats d'apprentissage des étudiants. Aucune des deux parties met en doute qu'un certain type d'incitation financière est nécessaire pour obtenir des résultats robustes. Puisque l'économie a fait que les mairies sont moins capables de fournir quelques-uns de ces types d'incitation financière, cette étude examine si les élevés coûts entraînés par des motivations liées à la rémunération sont aussi essentiels comme le débat actuel suggère. On constate que des facteurs de motivation virtuellement libres de coûts, comme le respect professionnel, environnement de travail positif, réussite personnelle, sécurité d'emploi et défi positif peuvent être plus efficaces pour attirer, retenir et inspirer des enseignants de qualité que toute restructuration ou amélioration de compensation financière.

Mots-clés: administration; éducation; personnel; technologie

La relación entre el salario y la atracción por el trabajo, lealtad al trabajo y desempeño en el trabajo de los profesores de Ciencia, Tecnología, Ingeniería y Matemática de alta calidad

Resumen: Mejorar la calidad de la educación en ciencia, tecnología, ingeniería y matemática es vital para la competitividad global. La necesidad de escuelas más eficaces y la centralidad del rol del profesor en cualquier plan de mejora sustancial de la escuela son bien conocidos. Los educadores, responsables políticos y facciones políticas están comprometidos en un intenso debate sobre si son los sistemas de remuneración por rendimiento o aumentos sustanciales en toda la escala salarial que son más propensos a motivar a los profesores para mejorar los resultados de aprendizaje de los estudiantes. Ninguna de las partes cuestiona que algún tipo de incentivo económico es necesario para obtener resultados sólidos. Una vez que la economía ha hecho las autoridades locales menos capaces de proporcionar cualquiera de estos tipos de incentivos financieros, este estudio pretende examinar si estos dispendiosos factores de motivación salarial son tan esenciales como parece sugerir este debate. Se muestra que factores de motivación virtualmente gratuitos, como respeto profesional, ambiente de trabajo positivo, desarrollo personal, seguridad en el trabajo y desafío positivo, pueden ser más eficaces en atraer, retener e inspirar los profesores de calidad que cualquier reestructuración o mejora de compensación financiera.

Palabras clave: administración; educación; personal; tecnología

1. Introduction

The attitude of the American public on paying STEM schoolteachers is little short of bipolar. One passionately-held view sees many teachers as minimally-skilled, lacking a deep commitment to excellence, and stupendously failing to produce a globally-competitive workforce. This group views the teaching profession as successful only in building politically astute labor unions that cajole state and local governments into paying them far more than their (presumed) one hundred eighty five days of annual effort are worth. The group resonates with editorials like the Wall Street Journal's "Is \$34.06 Per Hour 'Underpaid'?" (Greene & Winters, 2007a).

An equally fervent block of voters consider our teachers to be the unfairly maligned foot soldiers of democracy. They have only praise for the dedication of those who manage to instill personal ethics, patriotic ideals, and basic skills into a generation of young people who come to them with less preparation, less family support, less emotional stability, less respect for authority, less self-sufficiency, and a higher degree of entitlement than ever before. This group believes that our teachers have done so much, with so little, so quickly, and for so long, that society now unreasonably expects them to do everything with nothing by yesterday. They resonate with columns like the New York Times' recent "Pay Teachers More!" (Kristof, 2001).

Considering that American public schools spend more than \$197 billion dollars a year on salaries excluding benefits (Podgursky & Springer, 2011), it is not surprising that the debate about what that money is actually buying can get a little heated. Only by dispassionately examining the relationship between quality teaching and teacher compensation can we hope to tune out the drama from both poles and build a data-driven method for determining how and how much society should pay teachers. Without data, the two camps will continue to pass each other without engaging, like ships in the night.

2. The Teacher Matters Most

Any discussion of the relationship of STEM teacher pay to learning outcomes must begin by acknowledging that there is a problem to be solved and teachers must be at the center of solving it. Klein (2011) provides a sampling of the large mass of data that establishes the need to improve learning outcomes:

- 30% of American high school students fail to graduate.
- American College Testing Service claims that 76% of our high school graduates are not adequately prepared for college.

- In the latest National Assessment For Educational Progress tests, less than 33% of our students in grade eight were proficient in math, science, or reading.
- America ranks 48th among the developed nations in mathematics and science education.

While there will always be apologists such as Gratz (2009), who dismisses such facts the result of confusing learning metrics with “real achievement” (which he does not clearly define), the debate has generally shifted from whether a problem exists to how to solve it.

Policymakers have assumed that the way to get great teachers to do high quality work where they are most needed is to pay them very well to do so. The law of supply and demand suggests that better pay should have three benefits:

- Encouraging more energetic and academically capable undergraduates to consider teaching careers (Auguste, Kihn, & Miller, 2010).
- Providing the incentive for the most capable teachers to stay in teaching (Chamberlin, Wragg, Haynes & Wragg, 2002).
- Inspiring current teachers to do a more effective job in the classroom. (Robbins, 1999).

School districts can improve teacher pay by raising the steps of their salary schedule, instituting some form of pay-for-performance, or a combination of both.

3. Limitations of Across-The-Schedule Salary Increments

The across-the-schedule option suffers from inherent unfairness, a misconception about the presumed inadequacy of current teacher salaries, and untested assumptions about the marketability of teachers outside the teaching profession.

Step-and-level salary schedules were created with the best of intentions. They were meant to eliminate previous salary discrimination against female teachers (Koppich & Rigby, 2009). They guaranteed that traditionally female teaching jobs (such as elementary grades) were compensated the same as traditionally male teaching jobs (such as high school mathematics and science).

Across-the-schedule raises reinforce the inherent unfairness of step-and-level salary schedules by systematically widening the compensation gap between talented young teachers with Bachelor’s degrees and to their entrenched, but sometimes less effective, colleagues. These schedules reward college coursework and years of experience, neither of which has much to do with student achievement. No consistent relationship has been found linking an increase in student knowledge or skills to being in the presence of teachers

with Master's degrees, with the possible exception of science and mathematics (Duncan, 2011). Nor does student learning correlate to how long teachers have been teaching beyond a teacher's initial break-in period of three to five years (Hanushek & Rivkin, 2004, 2006).

Public expenditure watchdog groups cite data suggesting that teacher compensation is already more than fair and more than competitive. Data points such as these from the Manhattan Institute of Policy Research (Greene & Winters, 2007b) ring true to many Americans squeezed the current recession:

- The government Bureau of Labor Statistics claims that the average American public school teacher earned \$34.06 per hour in 2005.
- The average public school teacher was paid 36% more per hour than the average non-sales white-collar worker and 11% more than the average professional technical worker.
- Compared with public school teachers, editors and reporters earn 24% less; architects 11% less; psychologists 9% less; chemists 5% less; mechanical engineers 6% less; and economists 1% less.

One might also ask why, if teacher salaries are so bad, are so many mid-career business and industry professionals signing up for alternative teacher certification programs in the hope of landing second careers in the very tight teaching job market?

The relevance of comparing teacher pay to industry pay depends on another question. Do teachers have the skills that business and industry values and will pay for? If not, even the best teachers are unlikely to be able to leave the classroom for higher salaries elsewhere.

Aside from issues of fairness, salaries compared to those in business and industry, and the unlikelihood of many teachers having the skills to jump to a soft landing in private sector employment, there are several additional problems with across-the-schedule salary increases (Holley, 2008):

- High across-the-schedule salaries would encourage mediocre teachers to stay in the profession as much as exceptional ones, squeezing out the very bright young professional teachers that the higher salaries were intended to attract.
- Automatic salary increases based on longevity would attract risk-averse candidates who might not have confidence in their ability to succeed in a performance-based system.
- If salaries are increased in areas that are already over-supplied, like elementary teaching, there will be fewer dollars to attract strong candidates in high need areas, like secondary science and math.

For all these reasons, as well as the simple fact that the economy makes significant new spending for any public employees unlikely, across-the-schedule increases will be meager for the foreseeable future. If teacher pay is to be made a more effective tool for improving student learning outcomes, it must be through some form of performance pay.

4. Does Performance Pay Work?

Performance pay is any compensation scheme that rewards merit, value, and productivity, as measured by professional observations, peer evaluations, supervisor judgment, student test scores, and other standards. (Hess, 2010). The term sometimes includes extra pay used to attract exceptional talent to teach hard-to-find subjects or work in hard-to-staff schools (Viadero, 2011). Such incentives are more accurately called *differential pay* and will be excluded from our discussion.

Performance pay schemes often enlarge the total salary pool. Millions of dollars have been given to performance pay schemes by both the Federal government and private organizations, such as the Milliken Foundation. In Denver, taxpayers accepted substantial tax increases to fund performance pay schemes where they almost certainly would have rejected tax hikes to fund across-the-schedule pay raises for teachers (Dillon, 2008; Holley, 2008).

Performance pay with true accountability is particularly attractive when contrasted to salary improvement schemes which have no connection to student learning. For example, the National Council on Teacher Quality (2008) recommends that districts give a significant salary boost to teachers when they receive tenure "provided tenure is based on sufficient data to determine effectiveness". This idea has not been popular with school districts, and that extra clause is precisely the problem. Tenure in K-12 school districts is almost never based on sufficient data to determine effectiveness. In fact, it is rare to have "effectiveness" even defined at the school district level. In the absence of measurable standards, there is no reason to believe that a newly tenured teacher with five years of experience is any better at improving student learning outcomes than an untenured teacher with four years of experience.

There is surprisingly little data to confirm or refute that performance pay works (Dufferin, 2011). Many of the experiments were too short-lived to yield results worthy of confidence. The building of a performance pay plan is a profoundly political activity. Every sponsoring state, foundation, and district must engage in a consensus-building process to fashion a plan that it hopes will appeal to a unique collection of diverse local stakeholders. No sponsor has

replicated anyone else's plan with the objective of confirming earlier findings about what works and what doesn't. Several plans measure and reward performance in such unique ways that it would be hard to use their findings to predict what might happen in other districts (Dee & Keys, 2004; Lavy, 2007).

Only a few plans, such as the Tennessee Comprehensive Assessment Program (Springer, et al., 2010), were sufficiently randomized to eliminate the possibility that the self-selection of teachers and students into the program significantly skewed the results. Figlio and Kenny (2007) note that when whole schools within a district are given the choice of opting into a performance pay plan, it is often the most effective and innovative schools that opt in. It may well be that this self-selection, rather than the plan itself, drives the plan's apparent success in impacting learning outcomes.

Performance pay plans don't succeed or fail in a vacuum. A sense of being well compensated and fairly compensated is a necessary condition to bring about the benefits that performance pay plans seek, but not a sufficient one (Koppich & Rigby, 2009). Without other supports, such as improved evaluation and better professional development, these plans have no effect on learning (Dufferin, 2011). Many factors, such as effective administration and congenial working conditions, must also be present.

If the available data doesn't establish that performance pay plans work, neither does it confirm that they don't. For example, we know that the Chicago Teacher Advancement performance pay program (Glazerman & Seifullah, 2010) and the recent performance pay program in New York City public schools (Goodman & Turner, 2010) both failed to achieve anything approaching the expected results. Since each of these programs was uniquely tailored to its locality with rules and features unlikely to be adopted elsewhere, we cannot use them to predict that other programs are also likely to fail.

5. Performance Pay and Teacher Morale

We don't know whether performance pay reliably attracts more qualified STEM teachers, retains these better teachers, or motivates teachers to work harder. Can we at least confirm that performance pay makes teachers feel better about their jobs and that student learning benefits from their boost in morale? There are four reasons why even this cannot be claimed with certainty:

1. The education profession does not agree on what teacher behaviors are essential to effective teaching. There is broad consensus on some elements, like sensitivity to individual student needs, but fierce debate about the relative significance of other factors that a textbook might list. One teacher may think a dynamic

teaching personality is vital, another thinks it's all about perceptive diagnosis of learning styles, and a third focuses on dogged perseverance in demanding student effort. Still other teachers believe fine teaching is an artistic alchemy that can never be reduced to any list of behaviors. They claim that the true benefit of their teaching may take years to percolate through a student's consciousness and finally manifest in adulthood as an interest pursued or a career path taken. It is inevitable that many teachers will feel that a given performance pay system "got it wrong" in not rewarding the teacher behaviors they most value.

2. Nor are teachers more comfortable with rewarding results rather than behaviors. Any teacher whose students test poorly can, and probably will, claim explanations other than poor teaching. This might explain why some teachers feel justified in manipulating the test scores on which their performance pay is based. Dessoff (2011) notes that cheating has become a serious problem with significant scandals in major cities such as Baltimore and Atlanta.
3. Performance pay schemes must reward either groups or individuals. Either approach can adversely affect teacher morale. Individual awards can lead to unfriendly competition, an unwillingness to share best practices, and friction in the teacher's lounge (Coates-McBride & Kritsonis, 2008; Camins, 2011). Group rewards can lead to an individual feeling her salary is being dragged down by her unlucky placement in an inferior work-group or that some group members are "getting a free ride" to undeserved bonuses on the strength of her efforts (Goodman & Turner, 2010).
4. Performance pay schemes can force teachers to either teach in a way they find uncomfortable or lose out on extra pay. The most common complaint is being forced to "teach to the test" in ways which ignore student behaviors that the teachers value but are not tested, like creativity and group participation. (Hess, 2010). Some teachers feel compelled to use a triage system for allocating their effort. The students who are unlikely to improve their test scores much even with a huge amount of teacher assistance get minimal attention. The students whose scores are sure to rise with or without much teacher assistance are also left to their own devices. Students who the teacher judges can improve their scores enough to affect the teacher's performance rating, but only if the teacher invests considerable time in preparing them for the test, are the only ones who get the attention that all students deserve (Lavy, 2007). Teachers resent being forced into this type of thinking.
5. Gratz (2009) notes that teachers typically come to their task with the spark of altruism. They are motivated by a sense of the special trust that comes from working with children. Performance pay creates a dilemma that can damage that "natural motivation" (Lavy 2007).

6. Performance pay plans are pointless if everyone is rewarded regardless of how they perform. For performance pay to work, there must be winners and, by implication, losers. The losers are bound to feel unappreciated and lose some of their motivation to perform up to their potential. If the plan has too many losers compared to winners, the district-wide effect can be a net loss of motivation. Several researchers note that veteran teachers are often hostile to performance pay (Milanowski, 2007; Clabaugh, 2009; Goldhauber, DeArmond, & Deburgomaster, 2011; Muralidharan & Sundararaman, 2011). The fact that performance pay moves compensation from being an institutional issue to being an individual issue is seen as weakening the collective bargaining clout that has achieved so much salary growth for the veterans over the years (Chamberlin, Wragg, Haynes & Wragg, 2002).
7. Unlike younger teachers, who may overestimate the degree to which their personal efforts can contribute to test score improvement, veterans see student learning as the product of many factors, such as their students' innate abilities, parental support, administrative support, and the principal's commitment to discipline. They are not comfortable with having their paycheck determined by factors they can't control.

It is clearly time to revisit the core assumptions behind all this tinkering with teacher pay. Does how we pay teachers and how much we pay teachers really influence student learning? How much does pay matter compared to other incentives that school systems might find easier to equitably provide and pay for? If pay is not the key to better teaching and learning, what is? These are the areas of inquiry that drive this study.

6. Research Methodology

Policymakers need to focus on attracting the most promising candidates to teaching, retaining the best teachers, and inspiring all teachers to give their best effort all the time. This suggests six research questions:

1. What is the relationship between substantial across-the-schedule salary increases and attracting the most promising candidates to teaching STEM subjects?
2. What is the relationship between performance pay and attracting the most promising candidates to teaching STEM subjects?
3. What is the relationship between substantial across-the-schedule salary increases and retaining the best performing STEM teachers?
4. What is the relationship between performance pay and retaining the best performing STEM teachers?

5. What is the relationship between substantial across-the-schedule salary increases and obtaining maximum effort from STEM teachers?
6. What is the relationship between performance pay and obtaining maximum effort from STEM teachers?

The twenty-five research subjects are candidates for the Masters of Education degree in Instructional Design & Technology at West Texas A&M University in Canyon, Texas. All are certified as teachers with an average experience of seven years. This program is exceptionally demanding by local standards. Its participants include some of the most capable teachers that any district could wish to attract, retain, and inspire. Since the financial rewards of the M.Ed. are relatively modest in the schools of the Texas Panhandle, many subjects are taking the degree mostly to improve their skill set.

The subjects identified themselves as being members of one of two groups. The first group is Totally Committed to Teaching (TCT) in the K-12 public schools. They are currently teaching or actively seeking a return to teaching after a budgetary layoff. The second group is Not Totally Committed to Teaching (NTCT) in the K-12 public schools. This group is open to using their teaching and technical skills in business, industry, government, consulting, or self-employment. Some members are very serious about moving out of K-12 and see the program as the springboard to doing so. A few have already made the transition to business and industry. Others would be equally happy in a K-12 or non-K-12 position that met their needs.

This study compares the effectiveness of substantial across-the-schedule salary increases and performance pay to six other motivators in attracting, retaining, and inspiring teaching talent. Several of these factors were first identified in the McKinsey Report (Auguste, Kihn, & Miller, 2010):

- a. **Substantial Across-The-Schedule Salary Increases (SATSSI).** Such increases would affect the amount of pay that can be expected by anyone taking a position and the amount of growth in pay that can be expected over time. To be effective, such increases must exceed the rate of inflation by a significant margin.
- b. **Performance Pay.** This is the extent to which an individual can improve their personal pay through demonstrated excellence. In the teaching profession, excellence is usually measured by some combination of subjective methods, such as supervisor evaluations, and objective methods, such as improvement in student test scores.
- c. **Positional Respect.** This is the extent to which society admires members of a profession. Doctors typically enjoy very high positional respect. Retail clerks do not. While respect from parents reflects the attitudes of society at large and respect

(or lack of it) from students is a product of the students' developmental stage, the research subjects tend to conflate the two when responding to items about Positional Respect.

- d. Positive Working Environment.** This is the extent to which the workplace is pleasant and congenial. The most important element in Positive Working Environment is belonging to a group of highly-valued colleagues (Skaalvik & Skaalvik, 2011). Other elements include the perceived support of administration, and physical comforts, such as whether the building is maintained at a reasonable temperature.
- e. Technology Environment.** This is whether the hardware, software, and peripheral devices (such as printers) used on the job are up-to-date, in good repair, and well-supported.
- f. Personal Meaning.** This is whether the position is perceived by the employee as being of true service, if only in some small way, to the locality, state, nation, and the progress of Man. In the Texas Panhandle, such a position would often be considered a "calling" as much as a way to make a living. Altruistic jobs, such as working with the homeless, are likely to be high in personal meaning. Personal meaning cannot be assigned to a position by anyone other than the holder of the position. One school secretary might consider her role to be rich with personal meaning and another might consider the same job to be totally devoid of it.
- g. Job Security.** This is the perceived likelihood that the position will be immune to budgetary layoffs for the foreseeable future.
- h. Positive Challenge.** This is the degree to which the position demands the best that the employee has to offer. It includes such elements as high organizational standards, engaged helpful supervision, demanding but fair employee evaluation, and abundant opportunities for meaningful professional development.

The research instrument consists of three sections of 28 items each: one section on attracting quality candidates to a new position, one section on retaining valued employees in their current positions, and one section on inspiring maximum effort and enthusiasm from current staff. As shown in Table 1, each item consists of a pair of sentences corresponding to two of the eight listed motivators.

Two sample sentences for each motivator from the survey section on attracting quality candidates to a new position.

MOTIVATOR	SAMPLE SENTENCES FROM THE RESEARCH INSTRUMENT
1-Substantial Across-The-Salary Schedule Increases (SATSSI)	Bringing home a good salary would be very important to me in a new job. There is no point in entering a field that doesn't pay well.
2-Performance Pay	I want my job to pay me for the quality of my personal contribution. I wouldn't want to work in a place where low-quality performers get the same pay as hard workers.
3-Positional Respect	I want a profession that I can be proud to be a part of. Teaching would be a better job in Finland, where teachers are as respected as lawyers and doctors.
4-Positive Working Environment	Awesome co-workers would make a new job so much more attractive I need a job with up-beat professional people who are excited about what they do.
5-Technology Environment	I would be reluctant to take a job where they still used Microsoft Word 97 or Microsoft Word 2003. I expect my future employers to consider up-to-date computer hardware to be a high priority.
6-Personal Meaning	Any future career must be part of my world view and not just a way to make money. I don't just want a new job; I want a vocation beneficial to humanity.
7-Job Security	I wouldn't take a job unless I expected it to still be there in five years. There's no point in moving to a career field that has a high likelihood of layoffs in the next economic downturn.
8-Positive Challenge	I need a job that really tests how much I can contribute. I'd like a job where my supervisors set high but fair standards.

Table 1: Motivators and Sample Sentences

Subjects must choose the sentence from each item pair that seems most true for them. If they are not entirely comfortable with either choice, they still must choose the one they are most comfortable with. If they are strongly in agreement with both choices, they still must choose the one they most strongly agree with. This sample item from the survey matches the Positive Challenge motivator (8) with the Performance Pay motivator (2):

Choose the sentence which most closely represents your view:

- a. I'd like a job where my supervisors set high but fair standards.
- b. I want my job to pay me for the quality of my personal contribution.

Since the order in which the sentences are presented is irrelevant, there are 28 unique combinations of the eight factors in each of the three sections of items.

7. Data Analysis

A sentence representing each of the eight motivators was available to be selected seven times in each of the three sections. In the entire survey, each motivator was represented 21 (7 x 3) times. The data was analyzed to determine how often the two motivators concerning pay (SATSSI and Performance Pay) were chosen compared the other six available motivators. The TCT and NTCT groups were considered both separately and together. The data was further analyzed to see how often the two factors concerning pay were chosen in "head-to-head competition" with each of the other six factors in individual item pairs as shown in Table 1.

8. Factors in Attracting Quality STEM Candidates

Each of the 17 subjects in the TCT group responded to all 28 items in this section for 476 total responses. The 8 subjects in the NTCT group also responded to all the 28 items and contributed 224 total responses.

FACTORS CREATING INTEREST IN A NEW CAREER						
MOTIVATIONAL FACTOR	TOTAL COMMITTED TO TEACHING (TCT) GROUP		NOT TOTALLY COMMITTED TO TEACHING (NTCT) GROUP		BOTH GROUPS	
	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL
1-SATSSI	29	6.09%	17	7.59%	46	6.57%
2-Performance Pay	45	9.45%	17	7.59%	62	8.86%
3-Positional Respect	61	12.82%	38	16.96%	99	14.14%
4-Positive Working Environment	65	13.66%	33	14.73%	98	14.00%
5-Technology Environment	48	10.08%	22	9.82%	70	10.00%
6-Personal Meaning	85	17.86%	37	16.52%	122	17.43%
7-Job Security	66	13.87%	29	12.95%	95	13.57%
8-Positive Challenge	77	16.18%	31	13.84%	108	15.43%
Total	476	100.00%	224	100.00%	700	100.00%

Table 2: Factors Creating Interest in a New Career

Table 2 offers no support for the idea that either SATSSI or Performance Pay would be likely to induce quality teachers to move to new careers outside of teaching. For both the subjects who are not considering a move outside of teaching (TCT) and for those who are (NTCT), the two pay-related motivators are the least potent of all eight. For both groups taken together, five of the six motivators that are not concerned with pay attracted more than double the response that SATSSI did.

Part of the reason that teachers may not be thinking of leaving teaching to improve their pay is their lack of confidence in their personal marketability outside the classroom. They may well believe that they are doing as well financially right now as they are ever likely to do, even with the enhanced technology skill set they are gaining from their M.Ed. program. One subject put it this way: "I've decided to change my profession because I can't stand the bureaucracy anymore, but I haven't changed who I am. I wasn't a money-driven person as a teacher and I won't be a money-driven person in my next career either. "

Note that in Table 2, performance pay, though weak as a motivator for career change, still bests simply improving the salary schedule by almost 50% for the TCT group. This may reflect the fact that these tech-savvy teachers consider themselves to be stronger performers than their peers and more likely benefit from performance pay. NTCTs are apparently less confident about their ability to compete with the peers they anticipate having in business or industry.

An interesting finding is the primacy of the search for personal meaning in work. This is a very high motivator in the NTCT group and an even higher motivator in the TCT group. The common assumption is that people become teachers, in spite of relatively low pay, precisely because it offers a sense of mission. Apparently, these experienced teachers have found the public school classroom somewhat disappointing in that department. If anything were ever to attract them to a new career, it would be the chance to find personal meaning elsewhere.

Of the five top motivators (Personal Meaning, Positive Challenge, Positional Respect, Positive Working Environment, Job Security), only one has any direct cost. That would be the professional development aspect of the Positive Challenge motivator.

It is surprising that these technology Master's candidates rank Technology Environment down in the sixth position among the eight options, higher only than the two pay-related options, as a motivator for changing careers. Perhaps, as teachers, they have gotten by with less-than-ideal computer equipment for so long that they cannot conceive of the benefits of having high caliber tools.

9. Factors Inspiring Loyalty to Present Position

As illustrated in Table 3, once again, subjects think it only minimally likely that they would be motivated by pay considerations to stay in a job if they were already considering leaving it. When both groups are considered, both SATSSI and Performance Pay rank behind four of the other six motivators by a roughly 2:1 margin. The difference between SATSSI and Performance Pay has now been eliminated from the TCT group. This is probably because they are career teachers who think much pay improvement in any form is unlikely after many years of raises in the 2% range. They stay for other reasons.

FACTORS CREATING LOYALTY TO PRESENT CAREER						
MOTIVATIONAL FACTOR	TOTAL COMMITTED TO TEACHING (TCT) GROUP		NOT TOTALLY COMMITTED TO TEACHING (NTCT) GROUP		BOTH GROUPS	
	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL
1-SATSSI	46	9.66%	29	12.95%	75	10.71%
2-Performance Pay	46	9.66%	19	8.48%	65	9.29%
3-Positional Respect	47	9.87%	20	8.93%	67	9.57%
4-Working Environment	81	17.02%	33	14.73%	114	16.29%
5-Technology Environment	37	7.77%	18	8.04%	55	7.86%
6-Personal Meaning	76	15.97%	36	16.07%	112	16.00%
7-Job Security	69	14.50%	37	16.52%	106	15.14%
8-Positive Challenge	74	15.55%	32	14.29%	106	15.14%
Total	476	100.00%	224	100.00%	700	100.00%

Table 3: Factors Creating Loyalty to Present Career

The TCT group members are also much less likely to choose Positional Respect as a reason to stay in their current teaching positions than they are to choose it as a possible motivator for a career change (see Table 2). They are probably conflating their degree of respect from society at large with the degree of respect they get (or do not get) from their students on a daily basis, and have determined that Positional Respect is never going to be a reason to stay

in teaching. Instead, they will stay because of Personal Meaning, Job Security, Positive Challenge, and Positive Working Environment.

The NTCT group, who are already thinking about a move, imagine they might be more loyal to a future job which pays somewhat better, but even for this group, SATSSI still ranks fifth of eight factors inspiring loyalty. They do not think Performance Pay is likely to inspire their loyalty, again because they may be unsure about how they will stack up against their future colleagues in the non-K-12 workplace. It is also not surprising that they hope future loyalty will be inspired by Job Security. Several shared in follow-up interviews that it was the immediate threat of a lay-off that motivated some of this group to try to improve their marketability with a Master’s in Instructional Design & Technology to begin with.

10. Factors Inspiring Enthusiasm and Effort in Current Position

It is axiomatic in the business world that compensation plays a large role in motivating maximum effort and enthusiasm from employees. If neither SATSSI nor Performance Pay would be effective in keeping high quality teachers in teaching, would either at least contribute to getting the most effort or enthusiasm from them in their current classroom roles?

FACTORS CREATING ENTHUSIASM AND EFFORT IN CURRENT POSITION						
MOTIVATIONAL FACTOR	TOTAL COMMITTED TO TEACHING (TCT) GROUP		NOT TOTALLY COMMITTED TO TEACHING (NTCT) GROUP		ALL SUBJECTS	
	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL	NUMBER	% OF TOTAL
1-SATSSI	48	10.08%	26	11.61%	74	10.57%
2-Performance Pay	51	10.71%	23	10.27%	74	10.57%
3-Positional Respect	36	7.56%	17	7.59%	53	7.57%
4-Positive Working Environment	87	18.28%	43	19.20%	130	18.57%
5-Technology Environment	49	10.29%	31	13.84%	80	11.43%
6-Personal Meaning	72	15.13%	29	12.95%	101	14.43%
7-Job Security	58	12.18%	27	12.05%	85	12.14%
8-Positive Challenge	75	15.76%	28	12.50%	103	14.71%
Total	476	100.00%	224	100.00%	700	100.00%

Table 4: Factors Creating Enthusiasm and Effort in Current Position

The data suggests that pay-related motivators, as shown in Table 4, would again be among the least effective on the list. Although the margins are narrower than in the first two tables, they are still considerable. Positive Working Environment gathered nearly double the response of either pay-related motivator as a factor in generating effort and enthusiasm. One subject spoke for many in her follow-up interview when she said, "I spent twenty years overseas in the military where the quality of your relationship with colleagues determined whether you made it back to you quarters at night or not. Nothing is as important as who is on your team."

Once again, our subjects seem to have lost interest in Positional Respect as a source of enthusiasm and inspiration. This may be because the TCTs are disappointed in the respect they actual get as teachers, and the NTCTs assume they will be entering their new non-teaching roles on the "ground floor".

Notice that the quality of the Technology Environment is considerably more important as a motivator for enthusiasm on a day-to-day basis than it was in motivating for loyalty to staying in the profession. This may reflect the discouragement teachers feel in dealing with the difficulty in getting broken equipment replaced or serviced in a timely manner in many districts.

11. Direct Comparisons Between Pay-Related Motivators And Specific Non-Pay-Related Motivators

This section notes how often the two pay-related motivators were chosen compared to each of the six non-pay-related motivators in turn. Since a close correlation between the responses of TCTs and NTCTs has already been demonstrated, we can simplify the analysis by considering all the research subjects as a single group. A preference for the pay-related motivator is indicated by any value over 50% in each binary choice. Table 5 focuses on the SATSSI motivator and also compares the two pay-related motivators against each other.

When an average of all three sections of questions is considered, every other available motivator (except Performance Pay) was chosen more often than SATSSI and by very substantial margins. For example, Table 5 shows that both Job Security and Positive Challenge were chosen over SATSSI by margins of about 4:1. The average margin of preference for all non-pay-related motivators over SATSSI is a bit greater than 2:1 with SATSSI being chosen only 30.9% of the time. This confirms earlier data analysis suggesting that pay has limited effectiveness in motivating teachers to seek new careers, stay in teaching, or become better teachers.

BINARY CHOICE BETWEEN SATSSI AND SPECIFIC OTHER MOTIVATORS				
IN QUESTIONS OPPOSING SATSSI AGAINST:	PERCENT CHOOSING SATSSI IN THE ATTRACTION TO NEW CAREER SECTION	PERCENT CHOOSING SATSSI IN THE LOYAL TO CURRENT CAREER SECTION	PERCENT CHOOSING SATSSI IN THE EFFORT & ENTHUSIASM IN CURRENT JOB SECTION	AVERAGE PERCENT CHOOSING SATSSI IN ALL SECTIONS
Performance Pay	60.00%	84.00%	80.00%	74.7%
Positional Respect	4.00%	44.00%	36.00%	28.0%
Working Environment	20.00%	52.00%	68.00%	46.7%
Technology Environment	48.00%	52.00%	12.00%	37.3%
Personal Meaning	20.00%	24.00%	48.00%	30.7%
Job Security	11.54%	16.00%	32.00%	19.8%
Positive Challenge	20.00%	28.00%	20.00%	22.7%

Table 5: Binary Choice between SATSSI and Specific Other Motivators

Previously, Performance Pay and SATSSI tracked fairly closely together as weak motivators. Now, when subjects were forced to make a choice between the two, SATSSI is stronger than Performance Pay with a 3:1 overall margin. The subjects are clearly skeptical as to whether Performance Pay would be a good deal for them personally overall, although we saw earlier that it has some mild attraction for TCTs as a potential reason to consider a new career should they ever waver in their commitment to teaching.

A surprising but not unreasonable number is the 20:1 preference for Positional Respect over SATSSI in the item section concerned with attracting subjects to a new career. One can just see the veteran teachers thinking: "I don't care how much money I make in my next job, but I'm not putting up with this lack of respect anymore!"

There is an anomaly to be explained in the 2:1 preference for SATSSI over Positive Working Environment in the section concerned with effort and enthusiasm in the current job. This data point is in conflict with the considerable enthusiasm for the Positive Working Environment motivator everywhere else it appears in the data. The answer is simply a flawed item that allowed a confounding variable to affect the result. The item offered this pair of options:

"If my job had good pay but dull uninterested co-workers, I might stay but it wouldn't get my best performance. Slow pay growth might cause one to become less interested in one's current job."

This study was done in the very conservative Texas Panhandle. People here take it as an article of faith that they are expected to rise above the ways of “The World” and embrace a higher standard of personal morality. To suggest that they might allow themselves to slack off in their responsibilities due to the unfortunate influence of others would not be in keeping with their collective self-concept. That this led to the widespread rejection of the first option was confirmed in the follow-up interviews.

Table 6 looks at items where the Performance Pay motivator is in direct competition with each other motivator. Since we have already looked at the comparison of the SATSSI motivator with the Performance Pay motivator, that comparison will not be repeated here.

BINARY CHOICE BETWEEN PERFORMANCE PAY AND SPECIFIC OTHER MOTIVATORS				
IN QUESTIONS OPPOSING PERFORMANCE PAY AGAINST:	PERCENT CHOOSING PERFORMANCE PAY IN ATTRACTION TO NEW CAREER SECTION	PERCENT CHOOSING PERFORMANCE PAY IN LOYAL TO CURRENT CAREER SECTION	PERCENT CHOOSING PERFORMANCE PAY IN EFFORT & ENTHUSIASM IN CURRENT JOB SECTION	AVERAGE PERCENT CHOOSING PERFORMANCE PAY IN ALL SECTIONS
Positional Respect	56.00%	32.00%	53.85%	47.28%
Working Environment	24.00%	48.00%	26.92%	32.97%
Technology Environment	40.00%	44.00%	61.54%	48.51%
Personal Meaning	48.00%	44.00%	57.69%	49.90%
Job Security	24.00%	48.00%	30.77%	34.26%
Challenge	16.00%	20.00%	34.62%	23.54%

Table 6: Binary Choice between Performance Pay and Specific Other Motivators

This table tells a now familiar story. When all three sections are averaged, Performance Pay is less motivating than any other item on our list. One would expect the Performance Pay motivator to work best in increasing the performance factors of effort and enthusiasm in the current job, but even here the results are mixed. Three of the six non-pay motivators were seen by the subjects as having much greater potential influence on effort and enthusiasm than Performance Pay.

One apparent anomaly in the data is the relative strength of Performance Pay against Personal Meaning when compared to SATSSI against Personal Meaning. Respondents may be assuming the possibility of a fair and empathetic administrative system to allot Performance Pay based on keen observation. In this

case, receiving Performance Pay would be strong evidence that the teacher had a high degree of Personal Meaning which was being expressed and noticed in the classroom, and the two variables would be somewhat conflated.

12. Summary

Three cautions must be applied when considering this data. The first concerns the idealized teacher image. The Texas Panhandle still holds on to that mythic model of selfless rectitude, the frontier spinster school teacher. In rural American culture, teaching is supposed to be a "calling" where love, pride, and a sense of virtue go a long way toward making up for a modest paycheck and limited benefits. Teachers are very much aware of this image and may have difficulty expressing how important some extra dollars might be to them at the end of the month, in addition to the privilege of serving 'Our Nation's Future'. Three subjects made it clear in their follow-up interviews that they were somewhat concerned with "looking greedy" in their survey responses.

The second caution is inherent in thinking of issues of compensation conceptually, rather than numerically. We have discussed what, but not how much. That is inevitable in this type of discussion, since constructs like Positive Working Environment and Positional Respect cannot be quantified. Salaries can. It is fair to assume some subjects were thinking about the 1.2% increment they would be lucky to get this year when answering items about financial compensation. They would certainly find 6% far more motivating as an attraction to a new career, a cause for loyalty to a current job, or a spur to increased effort and enthusiasm every day. Similarly, any performance pay scheme that adds significant money to total compensation is going to generate much more interest than one that simply redistributes existing money already earmarked for salary increments of some type.

The final caution is that the Texas Panhandle still has a larger proportion of married women teaching STEM subjects than the nation as a whole. Many of these women, though certainly not all, provide a second income the size of which is not critical to their family's welfare. This group can afford to be less concerned about pay.

With these reservations, the data from our group of exceptionally skilled and hardworking technology-oriented educators strongly suggests that neither higher salaries nor performance bonuses are going to attract the best candidates to teaching, keep the best teachers on the job, or consistently inspire the highest levels of effort and enthusiasm. If our society is going to positively impact student learning outcomes, we are going to have to address factors such as:

Positive Working Environment, Job Security, Positional Respect, Personal Meaning, and Positive Challenge.

Compensation must always be adequate and equitable, and the debate about defining those two terms will never end, but the motivators that this study suggests matter the most cannot be purchased with dollars. Determining how to improve the local levels of the abstract, but very real, motivators of teaching excellence examined in this study may be the greatest challenge schools will face in the years ahead.

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