



The Choice Architecture of Schoolteachers:
*An Approach to Teacher Compensation for the
Effective Classroom*

by

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Abstract

Children's achievement and successful academic competence are directly correlated to teacher quality and efficacy. American K-12 students' reading and math scores, as well as international competition results, have suggested that the education system is at risk. Although multiple education reform models and laws have been enforced to improve the state of K-12 school education, these results were not measurably successful. Furthermore, teacher shortage has proved to be a chronic crisis, stemming from high attrition rates and decreased enrollment in teacher preparation programs. This reveals the need to make the teaching profession more attractive, in a way that can increase teacher proficiency and efficacy as a solution to improve accountability for successful K-12 school education. Many studies have found that teacher pay is not the primary reason of teacher attrition, but rather stems from a lack of administrative support in conjunction with non-competitive compensation. Therefore, this preliminary study conducted two new trials: A Performance-Based Compensation (PBC) Index was developed as a proposed salary structure and the potential effectiveness was tested. The intended purpose of the PBC Index is to both properly compensate highly proficient teachers and provide strong support to struggling teachers to improve their own proficiency. Current teachers' perceptions and perspectives on this new model were evaluated and the implication of results were included in this study.

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Introduction

Education research has consistently reinforced that teacher quality is the single most important school-related factor in determining student achievement (Darling-Hammond, 2000; Goldhaber, 2009). The teacher shortage in the United States has been on the radar of school leaders, researchers, policymakers, and education advocates since the 1980s, and warnings of the possibility of severe shortages of qualified teachers have posed as a threat for a number of years (Ingersoll, 2001). Moreover, the *National Center for Educational Statistics* (NCES) has reported a meaningful decline in reading scores for American elementary- and middle-schoolers, with the results extending a decade-long period of stagnation where average scores in reading and math have remained flat (Belsha, 2019). However, the issues regarding student achievement are far more complex, as the nation's highest-achieving students have been doing better in both subjects when compared to 10 years ago and are on par with the top countries in the world, while the lowest-performing students have demonstrated declining progress. The NCES results highlight the troubling trend of an increase in education inequality in America, with the score gaps between the top and bottom performers widening over the years. With concerns of both student achievement regressing, yet faced with a shortage of highly qualified teachers in the United States, the question that arises is: How can America tackle these challenges, when the problems confronting the education system appear to be systemic? Therefore, the purpose of this study is to propose a new teacher compensation model designed to incentivize behaviors that reinforces student achievement outcomes and to investigate current teachers' perspectives and perceived outcomes of the proposed model.

Literature Review

Significance of Teacher Quality

Although substantive empirical research has demonstrated the clear correlation between successful academic competence of children and teacher quality (Goldhaber, 2009), the means of objectively measuring the quality and efficacy of American teachers have been widely disputed, particularly with regards to the concept of teacher-performance evaluations. In the past, teacher-evaluation systems were typically governed by state laws, yet designed and operated at the district level, relying heavily on classroom observations conducted by principals/administrators with wide variance in requirements and criteria (Sawchuk, 2015). However, due to a wave of new sophisticated research on teacher quality, a rise in philanthropic investments to boost teacher effectiveness, and efforts made by policymakers and advocacy groups to revitalize state laws on evaluation standards, teacher-performance evaluations became a central focal point of the education reform that took place in the 1990s through the 2000s.

One major catalyst to reconsider evaluation standards came from Stanford economist Eric A. Hanushek, where Hanushek's analysis approximated that "top-performing" teachers helped students gain more than a grade's worth of learning, whereas students taught by the "worst-performing" teachers achieved only half a year of learning (Hanushek, 1992). Hanushek's research supported the notion that teacher skill interpretation of differences in classroom achievement did indeed exist, yet many advocacy groups made the argument that modern quality-control systems for teachers were highly ineffective. According to findings from a 2009 report conducted by the New Teacher Project, less than 1% of teachers received unsatisfactory

ratings in the 12 school districts studied, with professional development systems nearly non-existent and poor performance often going unaddressed (Weisberg, Sexton, Mulhern, & Keeling, 2009). This revealed a significant opportunity to revamp teacher evaluation standards and improve teacher quality in the United States, by providing educators with better information on the strengths and weaknesses of their classroom management.

Rise of Teacher Performance Evaluation Reforms

In the same year, the Federal government provided \$4.3 billion of funding through the 2009 American Reinvestment and Recovery Act, which the U.S. Department of Education used to begin the Race to the Top competition, which challenged states to advance policies around improving student achievement outcomes, in addition to recruiting and retaining effective teachers (U.S. Department of Education, 2015). Grants were distributed in the form of awards to states that were determined as trailblazers, with ambitious yet achievable plans for implementing a comprehensive education reform. Furthermore, Race to the Top required the development and implementation of new teacher-evaluation systems that differentiated among at least 3 levels of performance, in addition to keeping student achievement in consideration. Major philanthropic activity further incentivize actions to rewrite laws governing teacher evaluations standards, particularly due to investments from the Bill & Melinda Gates Foundation, which has spent nearly \$700 million on its teacher-quality agenda alone (Sawchuk, 2013).

Spurred by competition for federal Race to the Top program funds, as well as conditions laid out by the U.S. Department of Education to states pursuing waivers of the No Child Left Behind law, widespread adoption of rigorous teacher evaluations was implemented with a

variety of key changes in education policy. By 2013, 41 states required evaluations to include objective measures of student achievement, representing a large upward shift from the 15 recorded in 2009 (Doherty & Jacobs, 2013). Moreover, states began leveraging teacher evaluation results to inform and shape professional development for all teachers, as most of the states with ambitious evaluation systems (25 and D.C. Public Schools) required teachers with poor evaluations to be placed on an improvement plan. However, unlike many professions where high performance is valued and rewarded with promotions and salary increases, the concept of basing teacher salary on performance was quite a foreign concept in education policy. Yet, over time, more initiatives to support performance pay initiatives were made, with Florida, Hawaii, Indiana, Louisiana, Utah, and D.C. Public Schools directly tying teacher compensation to teacher evaluation results. More surprisingly, was the overwhelming agreement of states (22 and DCPS) to write into state policy that persistent classroom ineffectiveness served as grounds for a teacher to be dismissed.

Modern Teacher Performance Evaluation Systems

Traditionally, policymakers have attempted to improve the quality of teachers by raising the minimum credentials required for those seeking to enter the profession. In particular, the No Child Left Behind Act required all teachers of core academic subjects to be “highly qualified,” with a minimum of a bachelor’s degree, full state licensure and certification, and demonstrated subject-area competence (U.S. Department of Education, 2001). However, research has shown that such paper qualifications have little predictive power in identifying effective teachers (Wayne & Youngs, 2003). Therefore, due to the desire for more objective measures and the

inclusion of student test scores as a requirement under federal initiatives, teacher performance evaluation systems evolved to operate with far greater sophistication than traditional checklists used in the past. Most systems consist of several components, each scored individually, with states and districts using a predetermined weighting formula to compile results from individual components to arrive at a final score. This refined approach gave rise to the statistical technique known as a “value-added” model, which attempts measure the average gain in performance for students assigned to each teacher so as to arrive at an estimate of how much each teacher contributed to the student’s learning (Gordon, Kane, & Staiger, 2006).

The new measures of teacher performance broadened the horizons of raising teacher accountability and facilitated data points for teachers to use in efforts to improve performance; however, with states given considerable discretion to develop their own measures – as long as student achievement impacts served as a key component – many teacher unions were adamantly against the rising use of value-added models, particularly due to the connection between evaluations and teacher pay (Antonucci, 2015). Yet, despite the criticisms of volatile error rates in value-added measures and teachers overly devoting efforts to “test-prep” (Schochet & Chiang, 2010), recent research shows that a balanced approach of multiple measures can identify effective teaching and the contribution that teachers can make to student learning (MET Project, 2013). Furthermore, studies investigating IMPACT – the controversial teacher evaluation system implemented in D.C. Public Schools by Chancellor Michelle Rhee – presented novel evidence of how “high-powered” performance-based incentives based on rigorous evaluations can aid in improving teacher quality (Dee & Wyckoff, 2013). However, empirical findings also indicated

that the dismissal threats significantly increased the voluntary attrition rate of low-performing teachers, posing a heavy dilemma to the current situation of the teacher labor market.

The Teacher Shortage Crisis

After years of heavy layoffs during the Great Recession, many schools found great difficulty in finding qualified teachers during the period of economic recovery when school districts recommenced their hiring processes. Providing the only direct estimate of the size of the teacher shortage nationally, the Learning Policy Institute's seminal 2016 study found that the school-going population was predicted to increase by approximately 3 million students in the next decade, which would necessitate hiring an additional 145,000 teachers to reduce average student-teacher ratios from the current 16-to-1 average to pre-recession ratios of 15.3-to-1 (Sutcher, Darling-Hammond, & Carver-Thomas, 2016). A follow-up study revealed that approximately 90% of the nationwide annual demand for teachers was created when teachers left the profession, highlighting the significance that attrition rates posed to the already short supply in the labor market (Carver-Thomas & Darling-Hammond, 2017). Furthermore, teacher turnover imposes heavy costs upon schools – estimates exceeding \$20,000 to replace every teacher who leaves an urban school district – as well as upon students, who have shown to produce reduced achievement for schools whose classrooms were directly affected.

Special attention has additionally been paid to the topic of falling enrollment in teacher preparation programs in the United States. It has been widely reported in educational policy that the total enrollment nationwide in teacher preparation programs has declined by more than one-third since 2010, during the context of increasing enrollment of bachelor degree programs over

the same period (Partelow, 2019). Analysis of data sets provided by the U.S. Department of Education Title II Higher Education Act has revealed that approximately 340,000 fewer students have elected to enroll in teacher preparation programs in the 2016-2017 academic year compared to the number of students who enrolled in 2008-2009, with a congruent 28% decline in the number of students completing teacher preparation programs in the same years. However, some experts have argued that the increase in teacher production have more than kept up with increases in student enrollment in public schools across America; and while the enrollment in teacher education programs have dropped in recent years, the bench of individuals with the necessary credentials to enter or reenter the teaching profession is far deeper than what would be suggested by solely evaluating enrollment measures in recent years (Cowan, Goldhaber, Hayes, & Theobald, 2016). The number of teachers produced by teacher preparation programs have grown steady since 1985, yet when tracking the number of teachers who newly enter the profession, the data reveals that only about half of these teachers are hired. Moreover, there appears to be consistent evidence of persistent staffing challenges in specific subjects, with STEM and special education fields struggling in particular (Goldhaber, Krieg, Theobald, & Brown, 2015).

Rise of Alternative Pathways to Teaching

Despite the mixed evidence surrounding the teacher shortage issue, the more significant ramification of the declining enrollment in teacher preparation programs is the effect on teacher quality and student outcomes. When examining the routes by which teacher candidates can obtain a license to teach, there exists various pathways into a career in education (Fraser, 2007).

However, the past thirty years have seen the range of pathways substantially and purposefully expanded, with a shorthand distinction being made between “traditional” and “alternative” pathways and programs (Grimmett, Young, & Lessard, 2012). The National Research Council (2010, p. 35) characterizes the former as generally referring to programs that are housed in institutions of higher education (IHEs) and lead to a BA or an MA degree, while the latter is used as a “catch-all” for other pathways designed to attract a wider range of candidates who lack certain credentials in teaching. Those following alternative route teaching preparation programs may be within an IHE (referred to as “alternative, IHE-based” providers) or outside an IHE (referred to as “alternative, not-IHE based providers). For reporting purposes, each state determines which teacher preparation programs are constituted as alternative programs (Congressional Research Service, 2018).

In recent times, the non-traditional pathways have been differentiated even further between alternative IHE-based and alternative non IHE-based preparation programs. Candidates following the alternative IHE-based pathway complete a teacher preparation program at a college or university after earning a bachelor’s degree, as opposed to traditional route candidates who complete the teacher preparation as part of their bachelor’s degree. Non IHE-based alternative certification programs are designed to attract individuals who already hold a bachelor’s degree in a specific content area but are seeking to switch careers (U.S. Department of Education, 2015). A troubling trend has revealed an explosive growth of IHE-based alternative programs that are affiliated with the for-profit sector. The broader for-profit higher education sector has received intense scrutiny as a result of poorer student outcomes and deceptive practices (U.S. Government Accountability Office, 2010). Moreover, studies have shown that candidates who follow this

type of alternative pathway have higher default rates, are less likely to be employed, and have lower earnings than students who attend traditional IHE preparation programs (Cellini & Turner, 2018). Yet analysis of Title II reports have demonstrated that traditional preparation programs have experienced the most consistent decline in completers of all program types in recent years, while there has been substantial growth of enrollment in alternative certification programs during the same period, especially of the non-IHE variety (Partelow, 2019). From 2010-2018, enrollment in traditional and alternative IHE-based preparation programs declined by 43% and 19% respectively, while enrollment in non-IHE alternative certification programs experienced a 42% increase. The implication of this trend is that the U.S. education system has been forced to make the unfortunate tradeoff of prioritizing teacher quantity over teacher quality.

Rationale and Purpose of the Study

As previously discussed, children's achievement and successful academic competence are directly correlated with teacher quality and efficacy. However, the current state of U.S. education shows that the teacher shortage crisis and in-service teachers' low proficiency both have contributed in stagnating student learning outcomes. Therefore, a new teacher compensation model is necessary, which should strive to increase both teacher quality and retention that can result in increased accountability and improved children's academic outcomes. Studies have revealed that a lack of pay is not the primary reason for teacher attrition, nor is high compensation the primary motivator to attract potential teacher candidates. However, deeper analysis into the teacher shortage topic reveal evidence of persistent staffing issues in attracting desired applicants in high-need subject areas, particularly around STEM fields (Cowan,

Goldhaber, Hayes, & Theobald, 2016). As such, maintaining a single salary structure based primarily on teacher experience and the possession of advanced education degrees, in the face of vastly different market conditions across fields, does not seem to be a reasonable solution.

The purpose of this study, therefore, is to develop a new teacher salary structure and investigate the effectiveness that performance-related pay could present in promoting the retention of high-quality teachers, while incentivizing behaviors that reinforce student achievement. An approach to a teacher compensation model which integrates modern teacher evaluation systems with performance incentives was developed to contribute to the body of knowledge of how best to structure incentives to positively affect the teacher labor market.

Proposed Model

The proposed teacher compensation model is a Performance-Based Compensation Index (hereinafter referred to as the "PBC Index") in which teachers' annual increases to base salary are guaranteed, with the level of magnitude distributed on a 5-point scale relative to the teacher's effectiveness and effort throughout the year. The PBC Index would replace traditional "step-and-lane" salary schedules where teachers earn raises for each additional year of experience ("steps") and can move to higher "lanes" by earning additional education credits and degrees. School districts would incorporate a multi-factor and objective performance evaluation system, where teachers are to be rated on a scale of 1 (Developing) to 5 (Distinguished) based on various criteria of achievement throughout the year. Teachers are to be awarded the percentage level of increase to their base salary according to the outcomes of their performance evaluation score. The proposed PBC Index for all base pay scale increase percentages is shown in Table 1:

Table 1: *PBC Index Scale*

5 points: Distinguished	4 points: Effective	3 points: Satisfactory	2 points: Applying	1 point: Developing
3%	2.5%	2%	1.5%	1%

Instead of being used as a means for punishing low-performing teachers, the primary focus of the PBC Index is to encourage and incentivize teachers to continuously put forth effort to increase their own teaching proficiency and efficacy, as teachers are able to "earn" the magnitude of their annual salary increase. Therefore, the PBC Index strives to give proper recognition to high quality teachers and suitably reward the “Distinguished” educators for their hard work and exceptional performance with a 3.0% increase to their base salary. Meanwhile, the lowest performing teachers would still receive a guaranteed 1.0% increase to their base salary for their accumulated year of experience, where administration can provide the proper guidance and support for the “Developing” educators to increase their score by leveraging results from the performance evaluation. Under the PBC Index, school administration should strive for every teacher to attain a score of 5, with the end-goal of improving student achievement due to enhanced teacher quality and efficacy.

Model Implementation Guidelines

- The PBC Index replaces traditional "step-and-lane" salary schedules
- However, large "one-shot" pay scale increases (e.g. achieving tenure status, receiving a National Board Certification, transitions from a Provisional to Professional teaching license),

as well as additional bonuses awarded separately from traditional salary schedules (e.g. school-wide achievement bonus) would still apply as usual with the PBC Index.

□ Individual schools/districts incorporate a multi-factor performance evaluation system that takes into consideration diverse criteria to precisely identify areas for improvement for teachers. The following metrics will serve as the inputs for the performance evaluation system and will be weighted equally:

- Student growth over the course of the academic year
- Assessments of teacher's content-area knowledge
- Student scores on standardized tests
- Professional Educator Review
 - Principal Observation + Review
 - Peer teacher Observation + Review
 - Department Chair Observation + Review
- Student evaluations
- Formal Self-evaluations
- Steps/Actions teacher has taken to improve throughout the year

□ For the segment of teachers who receive a score of 3 or below, administration will provide proper support and guidance programs for those teachers to improve their proficiency and efficacy

□ Again, school administration should strive for every teacher to attain a 5 on the PBC Index, with the end-goal of improving student achievement due to enhanced teacher quality and efficacy.

Administrative Support for Teachers & Students to Succeed

For the segment of teachers who receive a score of 3 or below, administration should provide the proper support and guidance programs to enable these educators to improve their proficiency and teacher efficacy. The primary focus should be to leverage the results of the Professional Performance Evaluation to precisely identify areas of improvement and guide the educator to successfully achieve a 5 on the Scale Index.

Examples of various forms of support teachers receive can be found below:

□ Collegial Support

- Formal Mentorship & Induction Program
- Formation of mentor-protégé pairs/teams
- Instructional coaching
- Model and demonstrate effective teaching strategies
- Focused observation and feedback
- Personal and emotional support
- Lead after-school and no-school day Professional Development Units

□ Administration Support

- Professional coaching on school policies, procedures, expectations
- Conferencing self-analysis
- Provide observation & analytical strategies to enhance teacher effectiveness
- Joint formulation of personal growth plan
- Provide financial support/stipends for professional development

- Facilitate after-school and no-school Professional Development Units
- Role of Protégé
- Develop active listening and consultation skills
 - Develop personal teaching style over time
 - Develop personal reflective practice
 - Attend Personal Development Units (after-school and no-school day program).

Examples of potential Professional Development Units can be referenced in Table 2. These Units were developed

Table 2: *Potential Professional Development Units*

Classroom Management	Planning for Instruction	Teaching Content	Engaging & Motivating Students
<input type="checkbox"/> A productive learning environment <input type="checkbox"/> Measurable rules & procedures <input type="checkbox"/> Positive classroom climate <input type="checkbox"/> Proactive behavior management <input type="checkbox"/> With-it-ness, overlapping, momentum	<input type="checkbox"/> Available resources <input type="checkbox"/> Long-range, unit and daily plans <input type="checkbox"/> Cumulative records <input type="checkbox"/> Student data <input type="checkbox"/> Instructional grouping <input type="checkbox"/> Pacing <input type="checkbox"/> Reporting to parents	<input type="checkbox"/> Curriculum guides <input type="checkbox"/> Program of studies <input type="checkbox"/> Expected learner outcomes <input type="checkbox"/> Testing <input type="checkbox"/> Diagnostic/formative/summative assessment <input type="checkbox"/> Professional resources	<input type="checkbox"/> Cooperative planning <input type="checkbox"/> Project approaches <input type="checkbox"/> Alternative delivery strategies <input type="checkbox"/> Working with parents <input type="checkbox"/> Cooperative learning <input type="checkbox"/> Use of alternative facilities

Research Questions

The PBC Index strives to be able to address the challenges of improving teacher quality and student achievement outcomes in the United States, while being framed in a positive lens so that educators are encouraged to stay at their job due to an enhanced sense of teacher efficacy. At

its core, however, the PBC Index is simply an outcome-based approach to whether school districts could be rewarding their teachers more effectively than traditional salary structures, in a way that incentivizes the right behaviors. Because the PBC Index is a preliminary study that directly impacts teachers' livelihoods, it is of utmost importance to gauge the attitudes and beliefs of current teachers to measure whether it can successfully accomplish its intended purpose and positively affect job satisfaction. Therefore, the following questions served as a framework for this study to investigate and assess the views and perspective of U.S. teachers.

1. Are perceptions of teachers positive and supportive towards the PBC Index?
2. Are there significant demographic variables that explain the variation in teachers' perceptions of the PBC Index?
3. Are there specific components of the PBC Index that can explain the variation in teachers' perceptions?

Methodology

Participants

The participants of this study consisted of 113 K-12 teachers in the United States, with all respondents verified to be over the age of 18 and currently working in the education sector. Participants were volunteers who rendered a consent for participation. Similar to the teaching profession, the participants were majority female, accounting for 73% of respondents and males constituting 27%. Among the study population, 44% teach at the Elementary level, 20% at the Middle School level, and 41% at the High School level. Respondents primarily consisted of highly experienced teachers, with 58% of participants having 11 or more years of teaching

experience, 28% having 4 to 10 years of experience, and 15% having 0 to 3 years of experience. Approximately half of the participants (50.4%) worked in school districts located in suburban communities, the rest of participants being fairly split between Urban (23%) and Rural (27%) communities. Table 3 summarizes the demographic information.

Table 3: *Descriptive Statistics for Study Participants*

Demographic Variable	Response Items	N	%
Gender	Female	82	72.6
	Male	31	27.4
Grade Level	Elementary	50	44.2
	Middle	23	20.4
	High	46	40.7
Years of Teaching Experience	0-3	17	15.0
	4-10	32	28.3
	11 +	66	58.4
School Area Type	Urban/Inner City	26	23.0
	Rural/Small Town	30	26.5
	Suburban	57	50.4
School Low-Income Level	0-25%	41	36.3
	26%-75%	42	37.2
	76% +	30	26.5
Teacher Union Status	Union Member	65	57.5
	Non-Union Member	48	42.5

Instrument

To answer the three research questions, a survey questionnaire was developed through Qualtrics. The survey questionnaire consists of a total of 40 questions, including 12 demographic questions, 8 questions regarding teacher perceptions on the proposed PBC Index, 9 questions regarding teacher perceptions on the performance evaluation criteria, 9 questions of attitudes regarding perceived outcomes of the proposed PBC Index, and 2 open-ended questions on the

overall survey and proposed model (See Appendix A for the entire set of survey questionnaire questions). The survey begins with an introductory section that explains key information about the research study, the general purpose, and survey instructions, with participants asked to confirm their consent for participation.

As a preliminary measure, survey participants were asked 6 basic demographic questions, including information regarding gender, grade levels taught, subjects taught, years of teaching experience, school area type, as well as whether the participant supported performance-based compensation for teachers in general. These questions not only served to increase the respondent's accountability to finish the rest of the survey, but also acted as a screener for invalid participants. In particular, the question regarding current grade levels taught has option choices consisting of "Elementary (K-5th grade)," "Middle School (6th-8th grade)," "High School (9th-12th grade)," and a "None of the Above" option. On the chance that a participant selects the "None of the Above" option, Qualtrics will immediately end the survey, effectively filtering out all unqualified respondents who are not current teachers. When the participant enters a valid choice, they are taken to a full explanation of the PBC Index and its implementation guidelines, where it is emphasized that reading and comprehending the PBC Index is imperative to sufficiently answer the questions to the survey.

Because it is a necessity for participants to have an accurate understanding of the PBC Index in order to provide value-added input, three comprehension questions of the PBC model content were developed and implemented to test the respondent's basic comprehension of the functionality and implementation. If an individual incorrectly answers a model comprehension question in a manner that is clearly contradictory to the PBC Index's function, Qualtrics ends the

survey for the respondent. This effectively filtered out participants that did not have a correct grasp of the proposed model, mitigating the risk of skewed survey responses. Due to the substantial volume of the model explanation, a link to a Google Document of the PBC Index appears at the top of every page for an available reference throughout the questionnaire.

After demonstrating their knowledge of the proposed model, participants were asked 3 questions regarding their attitudes towards the PBC Index itself, in addition to asking respondents to rate how they feel about individual attributes of the model (5 questions) and each component of the teacher performance evaluation criteria (9 questions). Responses gauging teachers' attitudes were coded on a 5-point Likert scale, with 5 being "Strongly Approve," 4 for "Moderately Approve," 3 for "Neither Approve nor Disapprove," 2 for "Moderately Disapprove," and 1 for "Strongly Disapprove."

The next section of the questionnaire was comprised of 9 questions regarding the participant's perceived outcomes of the PBC Index. Respondents were asked to "Please rate the following statements as if the PBC Index was implemented in your school district," with responses coded on a 5-point Likert Scale. The statements were designed to investigate the self-perceived impact that the PBC Index would have on participants' teacher quality, motivation, desire to continue teaching, and workplace culture. Additionally, participants were asked whether the PBC Index "would make me feel punished if I received a score of 3 or below," as well as "would reinforce my high effort and performance if I received a 4 or above," to examine current teachers' expected reactions after receiving scores on either spectrum of the PBC Index.

The survey concludes with 6 additional demographic questions that had greater nuance, consisting of information related to school low-income level, teacher union status, and future

plans to continue teaching. Participants were also asked to self-assess their level of risk tolerance on a 7-point Likert Scale, where 1 represents “Extremely Risk Averse,” 2 for “Moderately Risk Averse,” 3 for “Slightly Risk Averse,” 4 for “Risk Neutral,” 5 for “Slightly Risk Seeking,” 6 for “Moderately Risk Seeking,” and 7 for “Extremely Risk Seeking.” The questionnaire then inquired whether the respondent’s school currently utilizes a “step-and-lane” salary schedule, where if the participant answers “Yes,” they are shown an additional question asking participants to describe how the PBC Index is similar or different to their current salary schedule model. Respondents are asked to rate their level of satisfaction in regard to their current salary schedule/compensation model, with responses coded on a 5-point Likert Scale ranging from “Completely Satisfied,” to “Completely Dissatisfied.” Lastly, survey participants were given the opportunity to provide written input of any confusing aspects of the survey, as well as any last comments respondents wished to provide.

Data Collection

The survey was sent out to current schoolteachers through third-party online panel Lucid Marketplace. The panel sent all responses anonymously, with no identifiers except for a random ID number. Lucid Marketplace charged \$5.00 for every verified survey respondent and handled all expenses directly with the study participants, nullifying the need to collect any personally identifiable information. The survey had originally received 321 responses in total, but after screening out both illegitimate and low-quality responses, 113 valid participants remained. The ID numbers of both the valid and invalid responders were collected and sent to Lucid Marketplace, where the panel provided compensation only to those who were verified to be

qualified participants. To receive financial support from the University of Michigan, it was required of the researcher to obtain a PEERRS certificate for Human Subjects Research Protections. Thereafter, all IRB standards were adhered to and the researcher successfully submitted an IRB application for approval of the survey questionnaire.

Data Analysis

Various data analyses methods were incorporated to determine validity and significance. These methods consisted of linear regression analysis, single-factor ANOVA testing, two-sample T-Tests, and descriptive statistics. Data from the survey questionnaire was collected through Qualtrics, which was exported to Microsoft Excel with responses coded as numeric values. Descriptive statistics for the 26 quantitative statements using the Likert scale data were analyzed using the Data Analysis functionality provided by Microsoft Excel. From the qualitative open-ended questions, various comments were utilized to better explain the quantitative data results. The study's research questions were used to guide the investigation.

Research Question 1: Perceptions of Teachers Toward the PBC Index

In the first stage of analysis, the data to determine the overall perceptions of current teachers were analyzed using descriptive statistics. Means scores and standard deviations were calculated for each of the quantitative statements from the 5-point Likert scale data. In order to gain a better understanding of the distribution of answers given, percentages of response choices selected were calculated for every quantitative statement, in addition to plotted histograms. Conditional formatting was implemented via Data Bars, which served to provide the researcher

with visualizations to highlight important results and identify unexpected data ranges in the survey responses.

Research Question 2: Significant Demographic Variables

In the second stage of analysis, several statistical methods were utilized to determine differences in opinion for individual demographic variables. The original set of variables selected for analysis included grade levels taught, school area type, years of teaching experience, existence of a current “step-and-lane” system, teacher union status, school low-income level, and general support of performance-based compensation. Due to the relatedness of several variables, it was critical to ensure that the individual characteristics were controlled for when explaining differences in opinions. Therefore, linear regression analysis was used with the preliminary set of demographic variables, with participants’ perceptions of the overall PBC Index comprising the dependent variable. Grade levels taught was controlled for with the variable *Grades Taught* (Elementary coded as 1, Secondary coded as 2), where Middle and High school teacher responses were combined due to the limited number of Middle school responses and high number of teachers who taught at both the Middle and High school level. School area type was controlled for with the variable *School Type* (Inner City/Urban coded as 1, Suburban coded as 2, Small Town/Rural coded as 3). Years of teaching experience was recorded as a continuous variable and categorized into 3 buckets to capture the distinction between novice, mid-level experience, and veteran teachers (0-3 years coded as 1, 4-10 years coded as 2, 11+ years coded as 3). Existence of a “step-and-lane” salary schedule as the current system was controlled for with the variable “*Step-and-lane*” system (non-existence coded as 0, existence coded as 1). Participants’ membership status in a teacher union or any employee association similar to a

union was controlled for with variable *Union Membership* (non-union members coded as 0, union members coded as 1). Low-income level of school districts where participants were categorized into 3 buckets to primarily distinguish between high-poverty, mid-poverty, and low-poverty school. In the U.S., the percentage of students eligible for free or reduced-price lunch (FRPL) provides a proxy measure for the concentration of low-income students within a school, with low-poverty defined as public schools where 25.0% or less of the students are eligible for FRPL; mid-low poverty schools as those where 25.01 to 50.0% are eligible for FRPL; mid-high poverty schools as those where 50.1% to 75.0% of students are eligible for FRPL; and high-poverty schools where more than 75.0% of students are eligible for FRPL (National Center for Education Statistics, 2019). Due to the fact that a majority of schools generally fall within the mid-low and mid-high poverty level range and the primary objective of this research question was to determine significant differences of opinion based on demographic variables, the mid-levels were combined to provide clear distinctions between low-income levels (0-25% coded as 1, 26-75% coded as 2, 75%+ coded as 3). Prior support of performance-based pay for teachers in general was controlled for by variable *Support of perf-based comp* (teachers unsupportive of performance-based initiatives coded as 0, teachers supportive of performance-based initiatives coded as 1).

After controlling for multi-collinearity of the entire set of demographic variables, independent variables were further analyzed by categorizing demographic information into different dimensions with similar themes (e.g. school-level factors, individual-level factors, individual preferences). These dimensions were analyzed using single factor ANOVA tests and two sample T-Tests to determine differences in perceptions of the PBC Index, Performance

Evaluation Criteria, and Perceived Outcomes of the PBC Index. All two sample T-Tests were calculated assuming unequal variances.

Research Question 3: Approval/Disapproval of Specific Components Within the PBC Index

In the third stage of analysis, the data to determine the perceptions towards individual components of the PBC Index were analyzed using descriptive statistics. Results from the second stage of analysis were leveraged to identify significant differences of opinion by comparing mean scores and response choice percentages of the Likert scale data. Furthermore, qualitative responses from the open-ended questions in the survey instrument were examined to help further explain variance in responses.

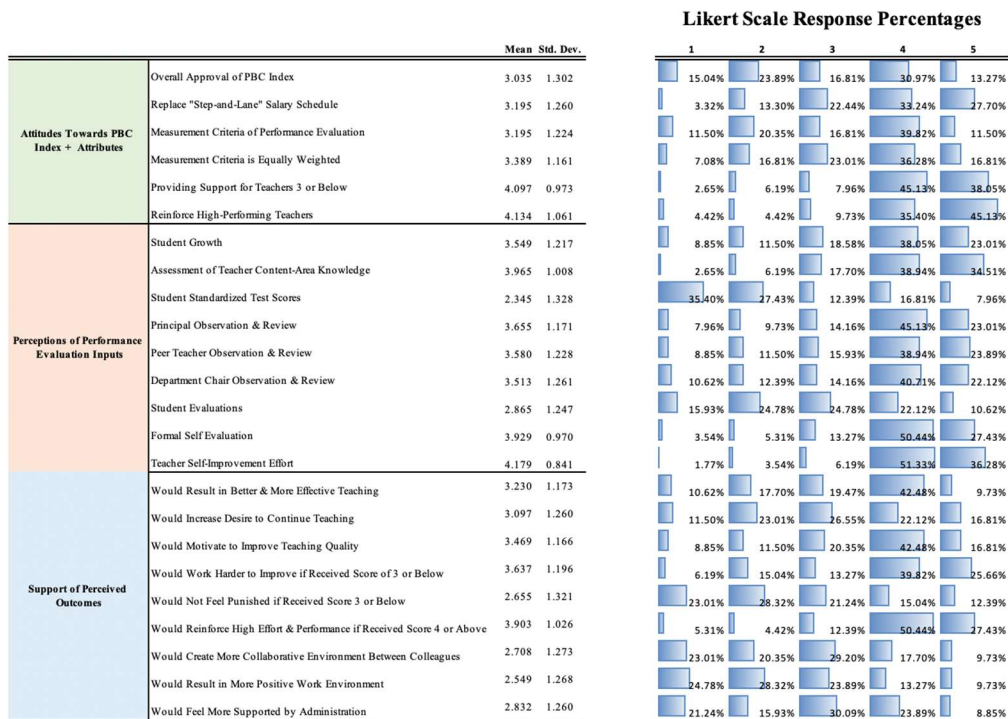
Once identified, the perceptions of individual aspects were divided into three categories: (i) Attributes Universally Liked, (ii) Attributes Universally Disliked, and (iii) Attributes with a Mix of Approval/Disapproval.

Results

Research Question 1: Are perceptions of teachers positive and supportive towards the PBC Index?

Overall perceptions of teachers were analyzed by measuring mean scores and standard deviations of Likert scale data, in conjunction with calculated percentages of individual response choices. Approximately 44% of participants strongly or moderately approved the PBC Index model while 39% disagreed. Table 4 represents the mean scores, standard deviations, and percentage values of overall perceptions towards the PBC Index.

Table 4. Mean scores, standard deviations, percentage values of overall perceptions



When faced with the follow-up question: “How would you feel if the PBC Index was adopted at your own school district?” Participants were asked to decide whether “I would be willing to teach at my school” or “I would leave as soon as I could.” The majority of participants appeared to be willing to continue teaching at their job (82.30%), whereas 17.70% of participants indicated that they would leave their occupation at the first opportunity.

Research Question 2: Are there significant demographic variables that explain the variation in teachers’ perceptions of the PBC Index?

Overall differences in perception were first analyzed through linear regression with the entire set of preliminary demographic variables. With multiple categories analyzed, only one variable had a significant difference at $\alpha = .05$, identified as the support of performance-based

compensation for teachers in general, which possessed a p-value of 9.92E-11. Table 5 represents results from the preliminary linear regression of all demographic factors.

Table 5: Linear Regression Analysis of All Demographic Variables

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.61194174
R Square	0.3744727
Adjusted R Square	0.33277088
Standard Error	1.06351447
Observations	113

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	7	71.09678992	10.1566843	8.979768668	1.216E-08
Residual	105	118.7616172	1.13106302		
Total	112	189.8584071			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3.9331335	0.601565865	6.53815938	2.30558E-09	2.74033952	5.12592749	2.74033952	5.12592749
Grades Taught	-0.13931822	0.205621656	-0.67754644	0.499549537	-0.54702798	0.26839154	-0.54702798	0.26839154
School Type	-0.10241484	0.145636698	-0.70322137	0.48347416	-0.39118551	0.18635583	-0.39118551	0.18635583
Teaching Experience	-0.16447894	0.133830661	-1.22900787	0.221816071	-0.42984042	0.10088254	-0.42984042	0.10088254
"Step-and-Lane" system	-0.36200566	0.201788862	-1.79398236	0.075694079	-0.7621157	0.03810438	-0.7621157	0.03810438
Union Membership	-0.10741471	0.208024502	-0.51635603	0.606691536	-0.51988887	0.30505945	-0.51988887	0.30505945
Low-Income Level	-0.12016277	0.13007325	-0.92380844	0.357704173	-0.37807399	0.13774846	-0.37807399	0.13774846
Support of General Perf-Based Comp	1.53377479	0.213341766	7.18928516	9.92262E-11	1.11075748	1.9567921	1.11075748	1.9567921

To ensure that school factors were nonsignificant and controlled for multicollinearity in perceptions of the PBC Index overall, a second linear regression was performed on school area type and low-income level. The p-value of school area type and low-income level was 0.51 and 0.37 respectively, which were both greater than the significance level. To determine if existence of a “step-and-lane” system and support of general performance-based compensation were highly linearly related, a linear regression was tested with both dummy variables. Support of performance-based compensation proved to be significant once again, with a p-value of 3.13E-11, while existence of a “step-and-lane” system resulted in a p-value of 0.057. Because the latter variable appeared to be close to significance, a linear regression was calculated with solely “step-and-lane” as the explanatory variable and independent variable being overall perception of the

PBC Index. The resulting p-value proved to be insignificant with a p-value of 0.075. A single factor ANOVA was then calculated using the three categories of low-income level, which displayed insignificance with a p-value of 0.52.

To determine whether individual characteristics would better explain the variation in overall opinion of the PBC Index, a Single Factor ANOVA test was run using the three buckets developed for years of teaching experience. A significant difference was not determined to exist between the three categories with a p-value of 0.37. In order to verify whether years of experience had any significant impact on perceptions, the variable was re-categorized by tenure status, with the assumption that the average number of years to attain tenure status being 7 years (Armstrong, 2017). With non-tenured participants being those with 0 to 6 years of experience and tenured participants being those with 7 years of experience or more, a T-Test measuring difference in overall perception of the PBC Index yielded an insignificant one-tail p-value of 0.07.

The next step was to evaluate whether support of the PBC Index's perceived outcomes had significant variables that could explain the difference in responses. Respondents were asked to self-assess whether the PBC Index would successfully result in multiple outcomes for the participant, including better and more effective teaching; increased desire to continue teaching; greater motivation to improve teacher quality; facilitation of a more collaborative environment between colleagues; result in a more positive work environment; and create a greater sense of support by administration. Because the T-Test of tenured vs. non-tenured participants appeared to elicit a nearly significant p-value for overall perception of the PBC Index, T-Tests measuring the difference in responses for each of the perceived outcomes was developed. None of the T-

Test results suggested a significant difference between responses of tenured and non-tenured participants. Although school area type did not seem to elicit a significant effect on responses, the variable was re-categorized between participants assigned at Suburban communities and those working at Urban or Rural communities. T-Tests were then generated for each perceived outcome, where no significant difference was determined to exist between the perceptions of the two subgroups. The same process was repeated for the grade levels taught variable, where no significant difference was found in opinions of perceived outcomes between Elementary and Secondary teachers. The T-Test results of each perceived outcome for tenure status, school area type, and grade levels taught can be referenced in Table 6.

Table 6. T-Test Results of Elementary & Secondary; Tenure & Non-Tenure;

Urban/Rural & Suburban

	Urban/Rural	Suburban	T-Test (Two Tail)	Elem	Secondary	T-Test (Two-Tail)	Non-Tenure	Tenure	T-Test (One-Tail)
	Mean	Mean	p-value	Mean	Mean	p-value	Mean	Mean	p-value
Better & More Effective Teaching	3.250	3.211	0.859	3.333	3.136	0.372	3.371	3.162	0.212
Increase desire to stay	3.071	3.123	0.829	3.111	3.085	0.912	3.257	3.000	0.176
Support of									
Motivate to improve teaching quality	3.589	3.351	0.278	3.556	3.390	0.450	3.514	3.446	0.396
Perceived Outcomes									
Would create more collaborative environment b/t colleagues	2.768	2.649	0.623	2.759	2.661	0.684	2.943	2.581	0.101
More positive work environment	2.643	2.456	0.437	2.556	2.542	0.956	2.829	2.378	0.055
More supported by administration	2.929	2.737	0.422	2.796	2.864	0.776	3.000	2.730	0.170

Suggesting no other significant demographic variable effects, further analysis was completed to determine difference of perceptions between supporters of performance-based compensation for teachers and non-supporters. T-Test results were computed for all 24 quantitative statements including attitudes towards the PBC Index and all individual attributes, perceptions of performance evaluation inputs, and support of perceived outcomes. Appendix D represents calculated mean scores and one-tail p-values for all statements. Out of all 24 statements, only one question yielded a p-value greater than the significance level, suggesting

that prior support of performance-based compensation for teachers seem to explain variation in nearly all aspects of the performance-based pay model.

Research Question 3: Are there specific components of the PBC Index that can explain the variation in teachers' perceptions?

After examining the difference in responses between supporters and non-supporters of general performance-based policies for teachers, each of the three themes of the quantitative statements was analyzed individually. Among attitudes regarding the PBC Index, the mean responses from supporters for each attribute was 4.00 or above, while the responses from non-supporters ranged from 2.50 to 3.88. The lowest recorded response from supporters was given to the fact that all criteria were equally weighted from the performance evaluation system (mean of 4.00), while the lowest recorded response from non-supporters was given to the approval of the PBC Index (mean of 2.51). The highest mean responses of both subgroups were given to (i) how the PBC Index provides support for teachers who score 3 or below (3.88 for non-supporters, 4.53 for supporters), and (ii) how the PBC Index reinforces high-performing teachers (3.88 for non-supporters, 4.63 for supporters).

When evaluating perceptions of the performance evaluation criteria, the mean responses of non-supporters ranged from 1.92 to 4.00 and responses of supporters ranged from 3.18 to 4.53. The lowest responses of non-supporters were given to student standardized test scores (mean of 1.92) and student evaluations (mean of 2.52), while the highest response was given to teacher self-improvement efforts throughout the year (mean of 4.00) and formal self-evaluations (mean of 3.87). Similarly, the lowest responses of supporters were attributed to student

standardized test scores (mean of 3.18) and student evaluations (mean of 3.45), with the highest responses attributed to teacher self-improvement efforts (mean of 4.53) and principal observation and review (mean of 4.26).

When asked to rate their level of support of the PBC Index's perceived outcomes, the mean responses of non-supporters ranged from 2.45 to 3.68, with responses of supporters ranging from 3.05 to 4.34. Non-supporters and supporters both disagreed the most with how the PBC Index would not make them feel punished if a score of 3 or below was received. The next lowest response from non-supporters and supporters was attributed to the PBC Index facilitating a more positive work environment, with mean scores of 2.67 and 3.42 respectively. The most positive responses of both non-supporters and supporters was given to how the PBC Index would reinforce high effort and performance if given a score of 4 or above (mean of 3.68 and 4.34). The next highest response for non-supporters was associated with how the proposed model would increase motivation to improve teaching quality (mean of 3.45), while supporters appeared to believe that they would be likely to work harder to improve if given a score of 3 or below (mean of 4.18).

Discussion

Overall, the majority of teachers did not show generally negative perceptions of the PBC Index. Apart from the strongly and moderately disapproving participants, 61% of teachers provided positive acknowledgement of the proposed model, which was reinforced by 82% of participants saying that they would stay in their current position if the PBC Index was implemented in their school. Additionally, 59% of teachers believed that this model would

encourage them to increase their proficiency under this new salary structure, with 52% of teachers believing that the PBC Index would result in better and more effective teaching for them overall. However, it was quite clear that there were few participants that absolutely favored the model. Although the PBC Index was designed with the hope that teachers would be receptive to the payment structure, it was ultimately difficult to determine any definitive conclusions due to the large amount of variance. The question that arose then, was whether there were any specific demographic variables that could give greater clarity as to why the reception was so mixed.

The analysis measuring variance in perceptions yielded even greater ambiguity for why teachers had such differing opinions. It became apparent that demographic variables do NOT seem to explain the variation in people's perceptions, however, this lack of evidence is interesting in and of itself. Common sense would tell us that a person's background would have a great impact in how they perceive compensation based upon performance. For instance, there appeared to be a great deal of rhetoric about how certain types of teachers would be more willing to accept performance-based pay than others, particularly surrounding those who work in lower-income communities. A pertinent criticism for performance-based compensation is how teachers who are assigned to lower-level student classes (i.e. the segment of students who perform far below their peers, are often absent, may cause behavioral issues) have much more to lose when compared to those working with affluent students, since children directly impacted by poverty generally deal with homelife challenges that make it difficult to care about school performance. Meanwhile, teachers who teach at schools with highly educated parents have the advantage of dealing with students who naturally perform better which would lead to better compensation. Yet these demographic factors did not appear to significantly sway opinions one way or another.

What does seem to impact teachers' attitudes towards the PBC Index is their general perception of performance-based policies. While this may seem to go without saying, a way to interpret this relationship is that educators tend to have strongly rooted prior preferences towards incentive- and performance-based pay, as it has been a rhetoric pushed by what has been seen as "anti-education" think tanks in the past. A prominent example is the Koch Brothers, who have placed significant pressure on education policy for a massive education reform in the past 20 years with the agenda that schools should be run like a private business. Many pundits believe that this type of change would pose great harm to low-income students, and as one survey respondent noted, "We educate students to give them a better life, not for profit." Therefore, possibly due to the threatening undertones that policies similar to the PBC Index have elicited in the past, it suggests that teachers apply their general beliefs and values to any new proposal with great polarity. They either support it or are against it.

It is important to note that the non-significant nature of perceptions does not necessarily imply that teachers disliked the proposed model, as this does not appear to be the truth based on the descriptive statistics of responses. This simply naturally leads to the question of: what is it about performance-based pay specifically that teachers do or do not like? Are there specific components or attributes that we can identify that might explain the division of perceptions? After evaluating the results from Research Question 3, it seems as though we are able to get a better understanding of the aspects of performance-based initiatives that teachers agree and disagree upon.

Among attributes universally disapproved of, the performance evaluation inputs of student standardized test scores and student evaluations received the lowest rated responses from

both supporters and non-supporters of performance-based initiatives. Although these criteria were included as proxies for teacher accountability, it was clear that many teachers believed that too many external factors existed that would unfairly impact their score. As one participant remarked, “You cannot base a teacher solely on their students’ performance. Especially in inner city schools, education isn’t supported at home and therefore regardless of how educated a teacher is, they can’t force kids to care about their grades. This essentially creates a losing situation for the teacher, regardless of how hard they may try.” This perspective resonates the point made earlier of the difficulty in separating home life from academic performance. Whereas teachers can only control what occurs in the classroom, there is much more that goes into how well students will perform academically. Furthermore, it was mutually supported that the PBC Index did not seem to positively encourage low-performing teachers or facilitate a more positive work environment. Given the fact that many school districts operate under collective bargaining agreements with limited funding, participants seemed to perceive the scaled pay structure of the PBC Index as a way to “rank” teachers and tell newer teachers that they are not good enough, adding greater reason for them to be discouraged and leave. As one participant noted, “There’s a huge problem with retention of young/new teachers... you’re now putting them on the hot seat, before they’ve had time to get their feet under them and telling them they’re inadequate.”

When examining the performance evaluation criteria that were universally liked, teachers appeared to strongly approve of assessments of teacher criteria knowledge, formal self-evaluations, and taking into account steps/actions teachers make to improve their quality throughout the year. A common theme among these three criteria is how they are directly within the teacher’s control. The frustration that educators have with performance evaluation system

generally revolves around how they are being graded based upon benchmarks that they do not have direct influence over. This suggests that teachers desire greater input and want to have their perspective considered when being evaluated for performance. Moreover, the attributes that teachers approved of the most were how the PBC Index would be used to provide support for low-performing teachers who score a 3 or below, in addition to reinforcing the effort and performance of high-quality teachers. This was by far the most encouraging finding of the research study. The PBC Index was primarily designed to balance compensation in a way that would provide support for both high and low-performing teachers to positively impact student academic performance outcomes from both ends. Past salary structures had a tendency to overweigh teacher professional development with results that were not measurably successful and did not provide enough incentives for high-performing teachers to continually improve. While imperfect, the scaled compensation structure that enables educators to earn the extent of the salary increases does appear to be one potential method of addressing the needs of teachers that are on different spectrums of proficiency.

The aspects of the PBC Index that received mixed approval best showcased the reasoning behind the variance in perceptions. Interestingly, the most divided responses came from the professional educator review inputs to the evaluation system. The majority of participants appeared to be split in their opinion of incorporating principal and department chair observations. Moreover, there was mixed sentiment of whether teachers would feel supported by administration or not with the implementation of the PBC Index. However, it does not appear to be so much administration's observation and review that teachers are unsure of, as this is one of the most commonly utilized measures of performance evaluation systems across schools in the

United States. Rather, it seems to be the level of influence that administrators have upon the evaluation and implementation process of the proposed model that is the true source of uneasiness. The success of the PBC Index's intended purpose ultimately depends on local administration's support and commitment. As many participants noted, many administrators appear to have teachers that they favor over others, despite the availability of other highly qualified teachers within the school. A clear risk of the PBC Index is the potential of politically charged administrators to abuse their influence and distribute compensation in a manner that fuels cliques rather than rewarding the most competent teachers. As one participant remarked, "I am a great teacher and love my students, but I had a mean-spirited principal before who would make her evaluations based on whether she liked you or not. I could see people like her abusing their power and causing mental turmoil for good educators." Another teacher put it more succinctly, saying "I don't want to be paid less because I don't go out for drinks with my principal."

Conclusion

This thesis began by identifying three important issues in the current American education system: A lack of highly qualified teachers, a teacher shortage crisis with declining potential candidates, and high percentages of academically at-risk school children. The research study applied a business model of a performance-based compensation to the K-12 teacher salary system. The proposed PBC Index was designed to fairly compensate high-performing teachers while encouraging low-performing teachers to increase their own proficiency with strong support from administration, rather than being used as a means to threaten low-performing teachers that

was used previously in the D.C. Public School system. Therefore, the proposed model strived to provide a win-win compensation system for both high- and low-performing teachers, with the overall goal of positively impacting K-12 student academic outcomes. As a preliminary study, it was important to factor in present teachers' voices and perspectives to gauge how they would feel with the implementation of the PBC Index. While teachers generally appeared to positively view the PBC Index, it became clear that there was large variance in opinions. Although history tells us that the perspectives of teachers largely depend on their backgrounds, the survey instrument revealed that demographic variables did not appear to explain the difference in perceptions. What did seem to affect teachers' responses were their prior beliefs and attitudes towards performance-based initiatives in general. When evaluating the specific aspects that teachers approved and disapproved of, it became clear that educators supported the intended purpose of the PBC Index to provide support to both high- and low-performing teachers, yet the biggest sources of discrepancy were due to the level of trust teachers had for administration to correctly use their influence to achieve the intended outcomes of the proposed model. For the PBC Index to be successful, it ultimately depends on the support and commitment of administrators. Teachers need to be able to confidently trust their administration that they will receive the proper support and encouragement, rather than the PBC Index being used as a means of punishment. If implemented properly, teachers would be passionate and willing to improve their proficiency for the sake of their students, as well as for themselves. Furthermore, due to the limited amount of funding school districts usually face, in conjunction with the scaled structure of the proposed model, it appears that the PBC Index fosters a more competitive and less

encouraging working environment that it was originally intended for. This demonstrates clear areas for improvement to refine the PBC Index to account for these circumstances.

This thesis presented an approach to increase teacher proficiency and retention, with the end goal of improving student achievement outcomes. The PBC Index is not an absolute solution to all of the issues faced by the U.S. education system, but it can contribute to the body of knowledge of how best to structure teacher compensation to reward educators more effectively and resolve the dilemmas faced by school districts.

Appendix A: PBC Index Survey

Start of Block: Consent Form

Q1.1

UNIVERSITY OF MICHIGAN
ROSS SCHOOL OF BUSINESS

CONSENT TO BE PART OF A RESEARCH STUDY

1. KEY INFORMATION ABOUT THE RESEARCHERS AND THIS STUDY

Study Title: Teacher's Voices: Performance-Based Compensation Index

Principal Investigator: Youha Shin [Student at the Ross School of Business]

Faculty Advisor: Samantha Keppler [Assistant Professor of Technology & Operations; Ross School of Business]

Study Sponsor: University of Michigan - Ross School of Business Undergraduate Programs

You are invited to take part in a research study. This form contains information that will help you decide whether to join the study. Taking part in this research project is voluntary. You do not have to participate and you can stop at any time. Please take time to read this entire form and ask questions before deciding whether to take part in this research project.

2. PURPOSE OF THIS STUDY

Thank you for your participation during these strange times! By way of introduction, the researcher is a currently a student at the University of Michigan's Ross School of Business who is conducting this survey to complete a Senior Thesis. As a business student, the researcher is curious as to know whether a business perspective would be a useful way of framing a solution to the teacher shortage challenge in the United States. After much consideration and research, the researcher has designed a teacher compensation model with the purpose of retaining highly qualified educators while striving to improve teacher quality and efficacy. As it currently stands, this is a preliminary study that requires the views and voices of current teachers in order to refine components of the proposed compensation structure. Therefore, the opinions and insights that you provide will be massively informative and helpful for the development of this research model.

3. WHO CAN PARTICIPATE IN THIS STUDY

Because this study strives to take into consideration the perspective of teachers, the only important eligibility criteria is for participants to be over the age of 18 and current K-12 teachers located in the United States. Your response will be recorded anonymously and will not collect any personally identifiable information.

4. INFORMATION ABOUT STUDY PARTICIPATION

4.1 What will happen to me in this study?

On the following pages, the researcher has provided a description explaining the proposed compensation model with several

implementation guidelines of how the model will function, as well as an explanation of the rationale of the study.

The section describing the model is central to the research project and will need to be read & comprehended in order to sufficiently answer the questions of this survey. You must answer the comprehension questions correctly in order to complete the survey. However, the *Model Rationale* section was added simply for those interested in the reasoning behind the model and is optional to read. A link to a Google Doc will be included so that you may reference the model throughout taking the survey; therefore, please review the proposed model and answer the survey questions as honestly and forthcoming as possible, as your perspective is truly valued.

4.2 How much of my time will be needed to take part in this study?

The length of the survey will depend on how long it takes for the participant to read and understand the proposed model; however, the questionnaire is not expected to take longer than 15 minutes.

5. INFORMATION ABOUT STUDY RISKS AND BENEFITS

5.1 What risks will I face by taking part in this study? What will the researchers do to protect me against these risks?

There are very few risks expected of this study, as the purpose is solely to understand the insights and perspective of current teachers. While breach of confidentiality (i.e., informational risks) is a potential risk in all research, because your personally identifiable information will not be collected from your response, this risk is sufficiently mitigated. However, you do not have to answer any questions you do not want to answer.

5.2 How could I benefit if I take part in this study? How could others benefit?

You may not receive any immediate personal benefits from being in this study, however, this is an opportunity to share your perspective and experience that you have developed as a current school teacher. Your insights will additionally contribute to the development of the proposed compensation model, which could potentially be implemented in school districts one day to benefit future teachers across the United States. Your knowledge will be massively beneficial for the researcher to complete the requirements of their thesis.

6. ENDING THE STUDY

6.1 If I want to stop participating in the study, what should I do?

You are free to leave the study at any time. If you leave the study before it is finished, there will be no penalty to you.

7. FINANCIAL INFORMATION

7.1 Will I be paid or given anything for taking part in this study?

You will receive a small amount of compensation for your participation in this study, which will be handled by the platform in which you became aware of this opportunity. This was designed so that no personally identifiable information would be needed for collection by the researcher.

Participants who successfully complete the study will receive payment. Successful completion is determined at the sole discretion of the study author(s) using common methods to identify non-

genuine responses. Examples of non-genuine responses include nonsense answers, responses completed in an extremely short or long amount of time, failure to respond to instructions provided in the survey, and/or otherwise clearly failing to offer genuine responses. Participants should complete the study in one sitting without interruptions to help ensure their response is not considered as non-genuine due to time length. Only submissions considered genuine will receive payment.

8. CONTACT INFORMATION

Who can I contact about this study?

Please contact the researchers listed below to: Obtain more information about the study Ask a question about the study procedures Express a concern about the study

Principal Investigator: Youha Shin

Email: youha@umich.edu

Q1.2

9. YOUR CONSENT

Consent/Assent to Participate in the Research Study

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. If you have any questions about the study after you sign this document, you can contact the Principal Investigator using the information in the information provided above.

I understand what the study is about and my questions so far have been answered. I agree to take part in this study.

I consent to participation (4)

I do not consent (5)

End of Block: Consent Form

Start of Block: Introductory Demographic Info/Screener



Q2.1 Gender

- Male (1)
 - Female (2)
 - Other Preferred Description (3)
-

- Prefer not to answer (4)

Q2.2 What grades do you currently teach? (choose all that apply)

- Preschool (1)
- Elementary School (K-5th) (2)
- Middle School (6th - 8th) (3)
- High School (9th - 12th) (4)
- Higher Education (5)
- None of the Above (6)

End of Block: Introductory Demographic Info/Screener

Start of Block: teacher Qs



Q3.1 What subjects do you teach this school year? (*check all that apply*)

- English (includes reading, writing, or language arts) (1)
- Math (includes statistics, algebra, geometry, trigonometry, calculus, etc.) (2)
- Science (includes biology, chemistry, physics, etc.) (3)
- Social Studies (4)
- General Subjects (5)
- Physical Education (6)
- Special Education (7)
- Technology/Computers (8)
- Band/Orchestra/Music/Chorus (9)
- Foreign Language (10)
- Business Courses (11)
- Vocational Education (12)
- Other (13) _____



Q3.2 Altogether, how many years have you worked as a teacher?

Q3.3 Which best describes the area that your school is located? (check all that apply if necessary)

Inner city/Urban (1)

Suburban (2)

Small town/Rural (3)



Q3.4 True or False: I support performance-based compensation for teachers.

True (1)

False (0)

Q3.5 On the following page is a description of the proposed teacher compensation model. Please read through the model as if the system was going to be implemented in your own school district.

End of Block: teacher Qs

Start of Block: Survey Introduction

Q4.1 Performance-Based Teacher Compensation Index (Mandatory Read):

The proposed teacher compensation model is a Performance-Based Compensation Index (hereinafter referred to as the "PBC Index") in which teachers' automatic annual increases to base salary are guaranteed, while striving to reward high performing teachers based on the quality of their teacher effectiveness, effort, and performance. **The PBC Index would replace traditional "step-and-lane" salary schedules** where teachers earn raises for each additional year of experience ("steps") and can move to higher "lanes" by earning additional education credits and degrees. School districts would incorporate/develop their own multi-factor and objective performance evaluation system, where teachers are to be rated on a scale of 1 (Developing) to 5 (Distinguished) based on their achievement throughout the year. Teachers are awarded the **percentage level of increase to their base salary** according to their **performance evaluation score**, please see the proposed PBC Index for all base pay scale increase percentages in the table below:

Base Salary

5 points:	4 points:	3 points:	2 points:	1 point:
Distinguished	Effective	Satisfactory	Applying	Developing
3%	2.5%	2%	1.5%	1%

Instead of being used as a means for punishing low-performing teachers, ***the primary focus of the PBC Index is to encourage and incentivize teachers to put forth the effort to increase their own teaching proficiency and efficacy***, since an ***annual salary increase is always guaranteed*** and ***teachers are essentially able to "earn" the magnitude of their annual salary increase***. Therefore, "Distinguished" teachers (those who receive a 5 on the PBC Index) are recognized and awarded for their efforts with a 3.0% increase to their base salary. Meanwhile, "Developing" teachers (those who receive a 1 on the PBC Index) will still receive a guaranteed 1.0% increase to their base salary for their accumulated year of experience, where administration can provide the proper guidance and support for them to increase their score by leveraging results from the performance evaluation to precisely identify areas for improvement. ***School administration should strive for every teacher to attain a 5 on the PBC Index, with the end-goal of improving student achievement due to enhanced teacher quality and efficacy.***

Implementation Guidelines:

- The PBC Index replaces traditional "step-and-lane" salary schedules
- However, large "one-shot" pay scale increases (e.g. achieving tenure status, receiving a National Board Certification, transitions from a Provisional to Professional teaching license), as well as additional bonuses awarded separately from traditional salary schedules (e.g. school-wide achievement bonus) would still apply as usual with the PBC Index.
- Individual schools/districts will incorporate a multi-factor performance evaluation system that takes diverse criteria into consideration to precisely identify areas of improvement for teachers. The following listed metrics will serve as the inputs for the performance evaluation system and will be weighted equally:
 - Student growth over the course of the academic year
 - Assessment of teacher's content-area knowledge
 - Student scores on standardized tests
 - Professional Educator Review
 - Principal observational and review
 - Teacher/peer observation and review
 - Department Chair observation and review
 - Student evaluations
 - Formal Self-evaluations
- Steps/Actions teacher has taken to improve throughout the year
- For the segment of teachers who receive a score of 3 or below, administration will provide proper support and guidance programs for those teachers to improve their proficiency and efficacy (e.g. formal mentorship & induction program, instructional coaching, analytical strategies, conferencing self-analysis/personal growth plans,

- facilitate after-school Professional Development Units, etc.)
- Again, school administration should strive for every teacher to attain a 5 on the PBC Index, with the end-goal of improving student achievement due to enhanced teacher quality and efficacy.
-

Q4.2 On the following page, there will be 3 questions verifying your comprehension of the proposed model. Please answer the questions to the best of your understanding. A link to a Google Document with the PBC Index will be provided for your reference.

End of Block: Survey Introduction

Start of Block: Model Comprehension Check

Q5.1

To reference the Model and Rationale throughout the survey, please refer to the following link: [PBC Index \(opens in new tab\)](#)



Q5.2

In your understanding, which of the following best describes how the PBC Index functions?

- Teachers are rated on a scale of 1 to 5 based on **student standardized exam scores** and earn their **base salary** depending on the level of their students' exam score growth. (1)
 - Teachers are rated on a scale of 1 to 5 based on their **school's performance evaluation system** and earn their **base salary** depending on their performance outcome (2)
 - Teachers are rated on a scale of 1 to 5 based on their **school's performance evaluation system** and earn the **level of their annual increase to base salary** depending on their performance outcome. (3)
 - Teachers are rated on a scale of 1 to 5 based on their **years of experience and level of degree** and earn the **level of their annual increase to base salary** depending on their performance outcome. (4)
-



Q5.3 True or False: The PBC Index would replace traditional "step-and-lane" salary schedules but still incorporate large pay increases (such as achieving tenure status or receiving a National Board Certification).

True (1)

False (2)



Q5.4 True or False:

No matter how poor your performance outcome, your annual increase to base salary is guaranteed under the PBC Index.

True (1)

False (2)

End of Block: Model Comprehension Check

Start of Block: Attitudes/Beliefs towards PBC Index

Q6.1

To reference the Model and Rationale throughout the survey, please refer to the following link: [PBC Index](#) (opens in new tab)



Q6.2 How would you feel if the PBC Index was adopted at your own school district?

- Strongly Approve (5)
- Moderately Approve (4)
- Neither Approve nor Disapprove (3)
- Moderately Disapprove (2)
- Strongly Disapprove (1)

Q6.3 If the PBC Index was implemented at my school, I would:

- I would be willing to teach at my school (1)
- I would leave as soon as I could (2)



Q6.4 Which of these attributes of the PBC Index do you support?

	Strongly Approve (5)	Moderately Approve (4)	Neither Approve nor Disapprove (3)	Moderately Disapprove (2)	Strongly Disapprove (1)
Replacing traditional "step-and-lane" salary schedules (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The measurement criteria for the teacher performance evaluation system (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Measurement criteria are equally weighted in teacher performance evaluation (9)

Providing the proper support & guidance programs for teachers who score a 3 or below on the PBC Index (7)

Recognizing & Rewarding high-performing teachers for their exceptional output and effort (8)

Q6.5 Which of these measurement criteria for the teacher performance evaluation system do you support?

	Strongly Approve (5)	Moderately Approve (4)	Neither Approve nor Disapprove (3)	Moderately Disapprove (2)	Strongly Disapprove (1)
Student growth over the course of the academic year (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Assessment of teacher's	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

content-area
knowledge
(2)

Student
scores on
standardized
tests (3)

Principal
observation
and review
(4)

Teacher/peer
observation
and review
(5)

Department
Chair
observation
and review
(6)

Student
evaluations
(7)

Formal self-
evaluation (8)

Steps/Actions
teacher has
taken to
improve
teaching
quality &
effectiveness
throughout
the year (9)



Q6.6 Which of these statements do you think the PBC Index will accomplish? (check all that apply)

- Improve teacher retention (1)
- Improve teacher quality by threatening/pressuring low-performing teachers (2)
- Encourage both high- and low-performing teachers to continuously improve their teaching quality and efficacy (3)
- Incentivize teachers to "teach to the test" (4)
- Not discourage low-performing teachers while providing precise support for their development (5)
- Improve student achievement by increasing teacher quality and efficacy (6)
- Increase voluntary attrition of low-performing teachers (8)
- Encourage high-quality teachers to stay by rewarding them based on their high level of teaching effectiveness and effort (7)

End of Block: Attitudes/Beliefs towards PBC Index

Start of Block: Perceived Outcomes of PBC Index

Q7.1

To reference the Model and Rationale throughout the survey, please refer to the following link: [PBC Index](#) (opens in new tab)

	Strongly Agree (5)	Agree (4)	Neither Agree nor Disagree (3)	Disagree (2)	Strongly Disagree (1)
Would result in better and more effective teaching for me (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Would increase my desire to stay at my job (2)

Would motivate me to improve my teaching quality (3)

Would make me want to work harder to improve if I received a score of 3 or below (6)

Would not make me feel punished for poor performance if I received a score of 3 or below (5)

Would reinforce my high effort and performance if I received a score of 4 or above (4)

Would create a more collaborative environment between colleagues (7)

Would foster a more positive environment

in the
workplace (9)

Would make
me feel more
supported by
my
administration
(8)

Q7.2 Please rate the following statements as if the PBC Index was implemented by your school district:

End of Block: Perceived Outcomes of PBC Index

Start of Block: Concluding Demographic Information

Q8.1 What percentage of students in your school come from low income families?

- 0-25% (1)
- 26-75% (2)
- 75% + (3)
- Not sure (4)

Q8.2 Are you a member of a teachers union or an employee association similar to a union?

- Yes (1)
- No (0)

Q8.3 As I think about my future career plans, I believe that I will be a teacher for the next...

- 1-3 years (1)
- 4-9 years (2)
- 6-10 years (3)
- 10+ years (4)
- I am planning on leaving at the end of the school year (5)

Q8.4 How would you describe your level of risk tolerance?

- Extremely Risk Averse (1)
- Moderately Risk Averse (2)
- Slightly Risk Averse (3)
- Risk Neutral (4)
- Slightly Risk Seeking (5)
- Moderately Risk Seeking (6)
- Extremely Risk Seeking (7)

Q8.5 Does your school use a "step-and-lane" system as your current salary schedule?

- Yes (1)
 - No (0)
 - Prefer not to answer (2)
-

Q8.6 How is the PBC Index Model similar or different to your current salary schedule model?

Q8.7 How satisfied are you with your current salary schedule/compensation system?

- Completely Satisfied (5)
- Moderately Satisfied (4)
- Neither Satisfied nor Dissatisfied (3)
- Moderately Dissatisfied (2)
- Completely Dissatisfied (1)

End of Block: Concluding Demographic Information

Start of Block: Block 8

Q9.1 Please describe if anything was confusing in this survey.

Q9.2 Comments

End of Block: Block 8

End of Survey

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