

Teacher Job Satisfaction in the Context of the Wisconsin Educator Effectiveness System

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As part of our ongoing evaluation of the state of Wisconsin's Educator Effectiveness (EE) system, this brief presents data relevant to the question of how implementation of the EE teacher feedback process relates to teacher satisfaction with their job. Teacher job satisfaction in Wisconsin has been a particularly salient topic since the passage of Act 10¹ in 2011, which, among other things, greatly diminished the collective bargaining rights and retirement benefits of teachers. As a consequence of Act 10, districts have experienced increases in teacher turnover through retirements and transfers, which has resulted in teacher shortages in many districts.²

Also in 2011, Wisconsin passed Act 166, which required that Wisconsin schools implement standardized performance-based teacher feedback systems. Prior to the passage of Act 166, the state of Wisconsin Department of Public Instruction (DPI) was already developing such a system with its Educator Effectiveness (EE) process. Part of EE requires schools to provide ongoing, formal feedback to teachers about their instruction using standard teaching frameworks such as the Danielson Framework for Teaching (FfT) or the Stronge Teacher and Leader Effectiveness Performance System. Although DPI chose the FfT as the model that they would support, schools were given the option of choosing a framework of their own. About two-thirds of Wisconsin districts chose to use the FfT, which is the focus of this brief.

EE is still a young policy, having gone state-wide in 2014-15. The results of our evaluation of the first year of state-wide implementation of the FfT suggested that many teachers did not see the benefit that EE could have on their school, their teaching, and student learning, and that it contributed to their dissatisfaction with their jobs; many teachers did not understand why they were doing the EE system and reported that having to complete the process was taking time away from more important activities like outreach to parents and instructional planning.

Given that the first year of any policy or program is often wrought with implementation challenges, it is still unclear how EE will ultimately impact Wisconsin teachers. EE is designed, with full implementation, to improve the quality and quantity of feedback teachers receive, which could ultimately result in improvements to their instructional skills and satisfaction with their jobs. Full implementation would suggest that teachers have the necessary time and resources to complete the steps of their EE process, receive quality feedback about their instruction, have the opportunity to use this feedback to grow, and ultimately participate in development activities based on the feedback they receive.

It is the question of how EE implementation during the 2015-2016 school year, the second year of state-wide implementation, relates with job satisfaction that is the focus of this brief. Specifically, we used

¹ Wisconsin, State of (2011) Summary of provisions of 2011 Act 10. Retrieved November 12, 2016, from <https://docs.legis.wisconsin.gov/2011/related/acts/10.pdf>

² <http://projects.jsonline.com/news/2016/10/9/from-teacher-free-agency-to-merit-pay-the-uproar-over-act-10.html>

surveys of teachers to explore the relationship between their perceived capacity to complete the steps of their EE process and the quality of feedback they receive with their job satisfaction.

Methods

Participant Characteristics

During the spring of 2016, approximately 35,000 teachers, across 1,067 schools, and 282 school districts, participating in the FfT evaluation process were invited to participate in an online survey. This survey, sent directly to teachers through the Qualtrics survey program, included questions measuring job satisfaction, aspects of school climate, time/resources availability for EE, and the feedback process. Survey results were then matched with staff data maintained by DPI that includes demographic information such as teacher race, gender, education, years as an educator, and tenure in their current school. Survey results were also matched with school and district demographic information.

The current analysis only includes teachers in schools with at least 30% of teachers responding to the survey. Using this criteria results in 8,654 teacher survey responses across 641 schools and 182 school districts. Within these schools, there were 19,752 full-time teachers. Thus, the overall response rate for these schools was 43.8%. Table 1 presents the demographic breakdown of participating teachers. The average teachers had been in their school 11.7 years (SD = 8.9) and had been an educator 14.4 years (SD = 9.4).

Table 1: Teacher demographics

	Frequency	Percent
Gender		
Male	1843	21.3
Female	6811	78.7
Race/ethnicity		
White	8346	96.4
Black	47	0.5
Hispanic	130	1.5
Asian	71	0.8
Other	60	0.7
Education		
Bachelor's	3942	45.6
Master's	4647	53.7
Advanced	53	0.6

Of the 641 participating schools, 358 (55.9%) were elementary schools, 124 (19.3%) were middle schools, and 159 (24.8%) were high schools. Table two presents the average demographic characteristics (means and standard deviations) of participating schools.

Table 2: Study schools descriptive statistics

	Mean	SD
Disability %	13.16	4.37
F/R Lunch%	38.67	19.15
Hispanic %	9.40	10.28
Black %	4.96	8.38
Asian %	4.13	6.06
White %	76.54	19.96
ELL %	6.02	8.87
School size	477.46	344.89

Survey Instruments

Job Satisfaction – Job satisfaction was measured using the Brief Index of Affective Job Satisfaction.³ This four – question survey is a brief but valid measure of job satisfaction. Teachers were asked whether they *Strongly Disagree*, *Disagree*, *Agree*, or *Strongly Agree* with four statements about their job. Responses were recoded such that *Strongly Disagree* was coded as a 1 and *Strongly Agree* as a 4. In the current study sample, the internal reliability of responses for the scale was .93.

School Climate – Four subscales of the 5Essentials Survey⁴ were used to measure Teacher – Teacher Trust, Teacher Collaboration, Teacher – Principal Trust, and Principal Leadership. For the two trust scales and the Principal Leadership scale, teachers were asked whether they *Strongly Disagree*, *Disagree*, *Agree*, or *Strongly Agree* with statements about their principal or other teachers. Responses were recoded such that *Strongly Disagree* was coded as a 1 and *Strongly Agree* as a 4. For the Teacher Collaboration scale, teachers were asked how often they have participated in collaboration activities this past school year. Response options were *Never*, *Once or twice*, *3 to 9 times*, *10 or more times*. In the current study, responses were recoded such that *Never* was coded as a 1 and *10 or more times* as a 4. In the current study sample, the reliability of responses within each subscale ranged from a high of .95 for Teacher - Principal Trust to a low of .74 for Teacher Collaboration.

Feedback – The Examining Evaluator Feedback Survey⁵ was used to measure teacher perceptions of Feedback Quality, Evaluator Qualifications, Feedback Accuracy, Opportunity to Use Feedback, and Use of Feedback. Teachers were asked whether they *Disagree*, *Somewhat Disagree*, *Somewhat Agree*, or *Agree* with statements about the feedback process. Responses were recoded such that *Disagree* was coded as a 1 and *Agree* as a 4. In the current study, the internal reliability of these scales ranged from .80 to .95.

³ Thompson, E. R., & Phua, F. T. T. (2012). A Brief Index of Affective Job Satisfaction. *Group & Organization Management*, 37 (3), 275-307.

⁴ <http://help.5-essentials.org/customer/en/portal/articles/678255-essentials-and-measures-in-chicago-public-schools-reports>

⁵ Cherasaro, T. L., Brodersen, R. M., Yanoski, D. C., Welp, L. C., & Reale, M. L. (2015). *The Examining Evaluator Feedback Survey* (REL 2016–100). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Central. Retrieved from <http://ies.ed.gov/ncee/edlabs>.

Time/resources for EE – Two questions, written for the evaluation, were used in this study to measure teacher perceptions of the time and resources they had available to them to do the steps of EE. Teachers were asked whether they *Disagree*, *Somewhat Disagree*, *Somewhat Agree*, or *Agree* with two statements.

- I had enough time to complete the steps of our Educator Effectiveness system.
- I had enough resources to complete the steps of our Educator Effectiveness system.

Responses were recoded such that Disagree was coded as a 1 and Agree as a 4. The internal reliability for this scale was .83.

Analytic Methods

Correlations between all of the demographic characteristics and survey scales were first used to identify factors related to job satisfaction. Factors correlated with job satisfaction were then used to build three-level hierarchical linear models, with teachers nested within schools nested within school districts, building off of the following unconditional model:

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + r_{0jk} + u_{00k} + e_{ijk}$$

Whereby, the satisfaction of teacher i in school j and district k , is a function of school differences (r_{0jk}), school district differences (u_{00k}), and individual teacher differences (e_{ijk}).

The model was built incrementally, following the order presented in Figure 1 below, to provide a clearer picture of how teacher and school characteristics related with teacher job satisfaction. First, job satisfaction was modelled conditional on school and teacher demographic characteristics (step a). Then school-level factors (climate and EE implementation) were added to the model (steps b and c). Step c estimates the unique relationship of school-level EE implementation with teacher job satisfaction. Then, teacher-level factors (climate and EE implementation) were added to the model (steps d and e). Thus, step e specifies the unique relationship of individual teacher perceptions of EE implementation with job satisfaction. School-level variables were grand-mean centered and included as fixed relationships with job satisfaction across schools. Teacher-level factors were group mean centered and tested as random effects, to see if the relationships of teacher perceptions of climate and EE implementation with job satisfaction varied systematically across schools. Random effects that were not significant were then tested as fixed effects (not varying across schools). At each step, only factors that helped explain (were significantly related to) job satisfaction were kept in the model.

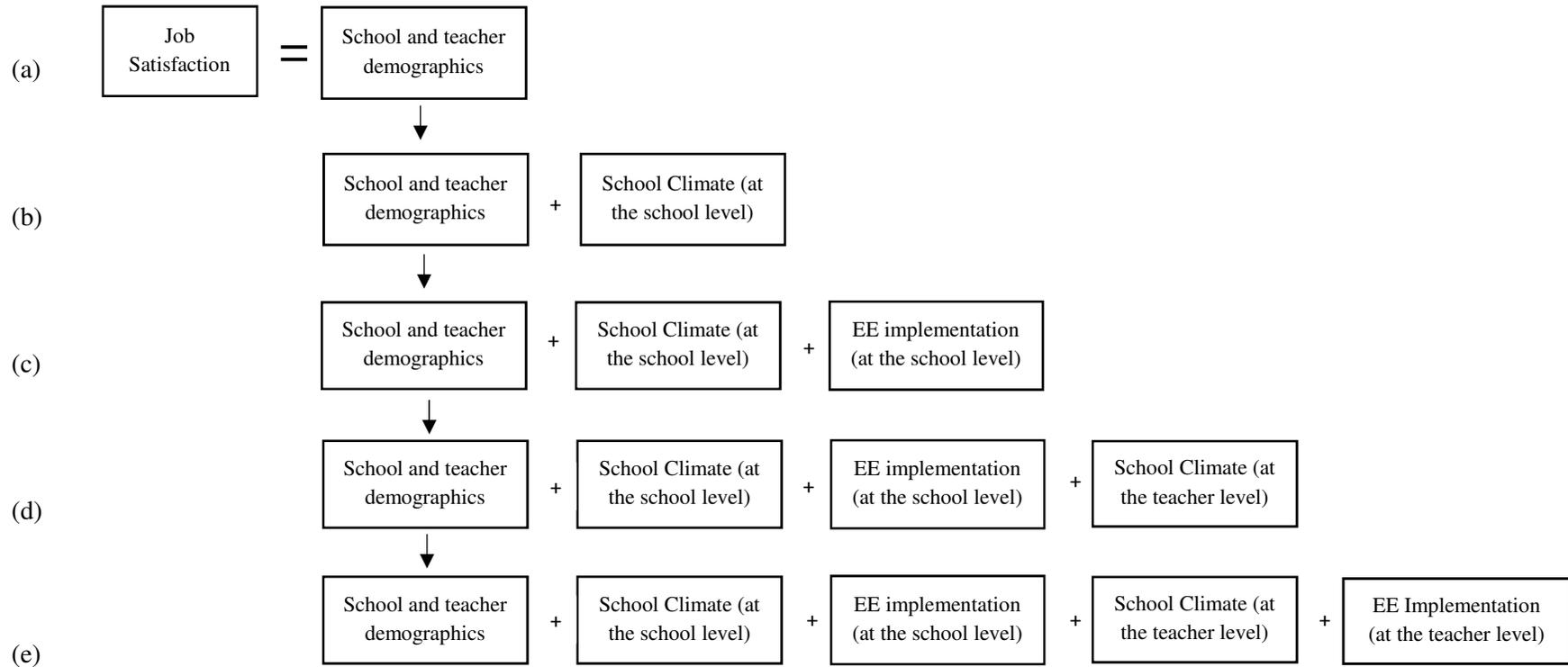


Figure 1: Incremental modeling strategy

Results

Descriptive Results

Descriptively, most teachers were in fact satisfied with their job. The majority of teachers either *Agreed* or *Strongly Agreed* with each of the four statements about their job. Table 3 presents a breakdown of the responses for the four questions that comprise the Brief Index of Affective Job Satisfaction. On average, teachers had less agreement with the statement that they are satisfied with their job than they did about whether they find enjoyment in it or that they are enthusiastic about it.

Table 3: Job satisfaction questions – teacher responses and descriptive statistics

	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean	Std. Deviation
I find real enjoyment in my job.	239	914	3708	2267	3.12	0.75
I like my job better than the average person.	234	1418	3450	1993	3.02	0.78
Most days I am enthusiastic about my job.	180	975	3816	2152	3.11	0.73
I feel fairly well satisfied with my job.	293	1302	3698	1821	2.99	0.78

Table 4 presents descriptive statistics for the survey instruments used to predict job satisfaction. The results of the time/resources survey suggest that many teachers felt they did not have enough time/resources available to them to complete the steps of EE.

The results of the school climate survey suggest that most teachers trusted both their principal and other teachers. Most also felt that their principal was a strong leader. Relatively few teachers, however, reported engaging in collaborative activities with other teachers such as observing another teacher’s classroom or going over student assessment data with other teachers.

Regarding the feedback process, most teachers felt their evaluator was qualified to provide them feedback about their instruction and that their feedback was accurate. However, fewer teachers felt that the feedback they received was high quality (timely and specific), that they were provided the opportunity to use feedback to improve, and that they used their feedback by trying new instructional strategies, seeking professional development opportunities, or changing how they plan for instruction.

Table 4: Teacher descriptive statistics

	Mean	SD
Job satisfaction	3.05	0.69
Time/resources available	2.32	0.93
Feedback process		
Feedback quality	2.39	0.96
Feedback use	2.45	0.96
Opportunity to use feedback	2.28	0.86
Qualifications of evaluator	2.97	0.89
Feedback accuracy	2.83	0.90
School climate		
Trust between Teachers and Principal	2.94	0.83
Principal Leadership	2.90	0.72
Trust between Teachers	3.02	0.67
Teacher Collaboration	2.41	0.64

Correlations between job satisfaction and other teacher and school characteristics

Appendix A presents the teacher-level and school-level correlations of factors included in this study. At both the teacher and the school levels, there were several factors that were significantly correlated with job satisfaction. Looking at school demographics, larger schools ($r = -.137$) with more students eligible for free/reduced lunch ($r = -.089$), more Black students, ($r = -.135$), more Asian students ($r = -.136$), and fewer White students ($r = .152$) had less satisfied teachers. Schools with longer tenured teachers ($r = -.083$) and more teachers with an advanced degree ($r = -.058$) also had teachers with lower job satisfaction.

There were larger school-level correlations found between school job satisfaction, school climate characteristics, and implementation of EE. Schools with greater trust between teachers and principals ($r = .409$), greater trust between teachers ($r = .284$), greater principal leadership ($r = .350$), and more collaboration between teachers ($r = .128$) had teachers who were more satisfied with their job. Further, schools with more time and resources available to educators implementing EE had more satisfied teachers ($r = .332$). Finally, schools with better implementation of the EE feedback process had more satisfied teachers, with accuracy of feedback ($r = .362$) having the strongest relationship with school job satisfaction.

Looking at individual teachers, again, there were small but significant correlations between their demographics and job satisfaction. Teachers with greater tenure in their school ($r = -.083$), who were White ($r = -.041$) and had advanced degrees ($r = -.058$) were less satisfied. Female ($r = .027$) and Hispanic ($r = .040$) teachers were more satisfied with their job.

More significant and sizable correlations were again found between job satisfaction and school climate characteristics, time/resources available to teachers to implement EE, and the EE feedback process. Teachers reporting greater trust in their principal ($r = .389$), greater trust with other teachers ($r = .279$), greater principal leadership ($r = .358$), and more collaboration with other teachers ($r = .200$) were more satisfied with their jobs. Further, teachers with more time and resources available to them to do the steps

of their EE process were more satisfied ($r = .276$). Finally, teachers reporting better implementation of the EE feedback process were more satisfied, with the opportunity for using feedback ($r = .318$) having the strongest direct relationship with job satisfaction.

Model Results

Considering the number of significant correlations, it is difficult to sort out which factors are the most important for determining teacher feelings of job satisfaction. Statistical modelling is a tool that can help clarify complex relationships between variables. As mentioned before, hierarchical linear modeling was used for this purpose because the data have a nested structure with teachers nested within schools, nested within districts.

The unconditional model, where only school and district are included, identifies how much of teacher job satisfaction was determined by their school and district. The unconditional model results suggest that only a small amount of differences in job satisfaction was determined by their school or district; only 1.2% of the variance was explained by the district and 4.5% was explained by school. The remainder (94.6%) was individual teacher differences.

The first block of variables added to the model included school and teacher demographic characteristics (step a). Although all of the school and teacher demographics were tested, only uniquely predictive factors were kept in the model. Appendix B presents these results. Demographic characteristics explained a large amount of the differences in job satisfaction between school districts (41.6%) but explained very little at the school (3.4%) or teacher level (1%). Based on these results, minority and less experienced teachers, in smaller schools with a greater percentage of white students, were more satisfied with their job. Again, though, these factors explained only a small amount of the variance in teacher job satisfaction.

Next, school aggregate climate factors were added to the model (step b). Appendix C presents these results. The inclusion of school climate explained most of the differences in job satisfaction between schools (pseudo $R^2 = 57.3%$). Of the aspects of school climate, teacher collaboration and principal leadership were not found to uniquely relate with job satisfaction so were removed from the model. The amount of trust between teachers and their principal and trust between teachers were the two climate factors that explained job satisfaction.

A final block of school-level EE implementation factors (step c) was then added to the model (Appendix D). None of the school-level aspects of the EE feedback process were found to explain teacher job satisfaction. However, school-level time/resources available to teachers to implement steps of the EE process was a significant predictor of job satisfaction. Teachers provided adequate time to complete the steps of EE were more satisfied with their jobs. The inclusion of this variable explained an additional 9.1% of the school-level variance.

Individual teacher perceptions of school climate were then added to the model (step d). Appendix E presents these results. The inclusion of individual perceptions of school climate explained a significant amount of the differences in job satisfaction between teachers (19.5%). Again, the amount of trust between teachers and their principal and trust between teachers were the only climate factors that uniquely predicted job satisfaction. Further, the relationship of trust between teachers and their principal

with job satisfaction was found to vary across schools. Thus, the random effect was included in the model. Table 14 presents the correlation of this with the overall level of job satisfaction in schools (INTRCPT1). The correlation of $-.778$ suggests that individual teacher perceptions of the trust between teachers and their principal is a more important determinant of individual job satisfaction in schools with lower overall levels of job satisfaction.

Finally, individual reports of EE implementation were added to the model (step e). Appendix F presents these results. The addition of EE implementation explained an additional 3.1% of the differences in job satisfaction between teachers. The four aspects of EE implementation that were uniquely related to job satisfaction were time/resources available to teachers to implement steps of the EE process, the accuracy of feedback, the opportunity to use feedback, and the degree that teachers used feedback to improve. The relationships between aspects of EE implementation with job satisfaction was found to be consistent across schools, and thus were included as fixed effects. Teachers who had the time to complete the steps of EE, perceived the feedback they received as accurate, had the opportunity to use feedback, and ultimately took advantage of these opportunities were more satisfied with their job.

Conclusions

The results of this analysis suggest that the impact of EE on job satisfaction is a function of how well it is implemented. So although our previous evaluations of EE suggested that EE was viewed by some teachers as having a negative impact on the school environment, the results from this study suggest that these negative effects of EE are more a concern when teachers are not provided adequate time to complete the EE process, are provided inaccurate feedback, or are not provided the opportunity to use feedback to improve. Considering that completing the EE process involves a great deal of school and teacher time and resources, it makes sense that teachers who are not provided the time or support to complete it, or do not feel that the feedback they receive is accurate, would be less satisfied with their jobs. Therefore, schools experiencing challenges with teacher morale should ensure that teachers have enough time to complete the steps of their EE process, the feedback provided to teachers is viewed as fair and accurate, and teachers have the opportunity to use it to grow professionally.

It is worth noting however, that the ability of schools to affect teacher job satisfaction may be limited. The finding that only 5.7% of the variance in teacher job satisfaction is determined by their school or district suggests that broad strategies to increase job satisfaction may have limited success. Since the great majority of the variance in job satisfaction is independent of school or district, efforts to improve it will likely be the most effective when done one teacher at a time. Talking to individual teachers is necessary to gain an understanding of the specific circumstances that are influencing their satisfaction with their job.

Regarding next steps in this research, we will explore the relationship of teacher perceptions of the implementation of EE with teacher job retention. Given that the overall morale of Wisconsin teachers was so profoundly affected by Act 10, the finding that job satisfaction was mostly independent of school climate and EE implementation is not surprising. It is possible however, that these factors may explain a greater amount of why teachers decide to stay or leave their current position. It may be that when teachers attribute the reasons for their relative levels of job satisfaction to factors located with their school, such as the implementation of EE or school climate, these factors would more greatly influence their decision to

stay or leave. So while climate and EE implementation, in the context of Act 10, have a limited but significant role in determining teacher job satisfaction, their role in determining teacher job mobility may be greater.

Appendix A

Table 5: Teacher level correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1 Years of experience in school	1																					
2 Total years as educator	.880	1																				
3 Female	-.031	-.026	1																			
4 White	.043	.049	.003	1																		
5 Black	-.01	<i>-.016</i>	-.011	-.416	1																	
6 Hispanic	-.046	-.041	0	-.649	-.011	1																
7 Asian	-.013	-.021	.009	-.453	-.008	-.012	1															
8 Bachelor degree	-.392	-.432	-.009	-.011	.003	<i>.018</i>	-.012	1														
9 Master degree	.391	.431	.011	.019	-.008	-.019	.007	-.979	1													
10 Ph.D./Ed.D	.014	<i>.017</i>	-.023	-.029	.036	.003	.019	-.078	-.089	1												
11 Time available	-.114	-.109	<i>.022</i>	-.031	-.011	<i>.022</i>	.029	.066	-.062	<i>-.025</i>	1											
12 FB quality	-.147	-.139	-.011	-.035	.01	.032	.032	.099	-.096	<i>-.024</i>	.398	1										
13 FB use	-.164	-.154	.051	-.060	.021	.041	.054	.104	-.103	-.011	.326	.503	1									
14 FB opportunity	-.147	-.136	.015	<i>-.026</i>	.013	.019	.018	.069	-.066	<i>-.022</i>	.516	.559	.507	1								
15 Qualifications of evaluator	-.115	-.104	.083	-.02	.015	.011	-.001	.070	-.068	-.013	.386	.641	.378	.497	1							
16 FB accuracy	-.128	-.120	.062	-.014	.003	.012	.018	.079	-.074	-.031	.401	.615	.334	.466	.647	1						
17 Teacher Principal Trust	-.115	-.095	-.007	-.014	-.003	.018	.002	.062	-.056	-.033	.301	.528	.303	.426	.608	.488	1					
18 Principal Leadership	-.084	-.063	.021	<i>-.025</i>	.002	<i>.023</i>	.014	.048	-.044	<i>-.024</i>	.348	.586	.377	.476	.643	.497	.862	1				
19 Teacher Teacher Trust	-.055	-.066	0	.002	-.014	-.003	.011	.032	-.032	0	.202	.236	.155	.242	.274	.248	.389	.359	1			
20 Teacher Collaboration	-.096	-.094	.078	-.006	.004	-.001	.012	.016	-.018	.003	.218	.237	.271	.377	.211	.197	.172	.225	.237	1		
21 Job Satisfaction	-.083	-.067	<i>.027</i>	-.041	.008	.040	.018	.058	-.058	.001	.276	.282	.226	.318	.304	.285	.389	.358	.279	.200	1	

Italicized correlations – p < .05

Bolded correlations – p < .01

Table 6: School level correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1 Years of experience in school	1																						
2 Total years as educator	.900	1																					
3 Teachers	-.028	-.015	1																				
4 Disability %	-.044	-.091	.001	1																			
5 F/R Lunch%	-.027	-.099	-.127	.472	1																		
6 Hispanic %	-.154	-.158	.160	.220	.431	1																	
7 Black %	-.183	-.182	.214	.281	.416	.513	1																
8 Asian %	.055	.022	.183	-.017	.017	-.004	.108	1															
9 White %	.168	.191	-.230	-.308	-.512	-.752	-.777	-.374	1														
10 ELL %	-.062	-.095	.106	.122	.401	.729	.442	.476	-.747	1													
11 Students	-.019	.004	.926	-.074	-.239	.073	.112	.130	-.103	-.028	1												
12 Time available	-.070	-.104	-.027	.017	-.049	.021	-.089	-.012	.054	-.024	-.023	1											
13 FB quality	-.052	-.048	-.113	-.069	-.051	-.025	-.107	-.001	.095	-.056	-.091	.527	1										
14 FB use	-.197	-.218	-.088	.015	.052	.056	-.019	-.046	.026	-.005	-.085	.452	.565	1									
15 FB opportunity	-.162	-.174	.017	.006	-.076	.058	.019	.042	-.032	.025	.026	.634	.607	.572	1								
16 Qualifications of evaluator	-.011	.001	-.151	-.035	-.019	.008	-.071	.015	.044	.020	-.141	.476	.739	.425	.549	1							
17 FB accuracy	.011	.010	-.100	-.043	-.089	-.033	-.133	-.013	.120	-.052	-.078	.533	.735	.406	.530	.763	1						
18 Teacher Principal Trust	.090	.098	-.097	-.081	-.060	-.044	-.109	-.011	.099	-.049	-.074	.317	.589	.287	.428	.690	.584	1					
19 Principal Leadership	.018	.024	-.114	-.055	-.030	.015	-.053	.049	.024	.033	-.101	.402	.684	.421	.510	.752	.604	.884	1				
20 Teacher Teacher Trust	-.043	-.054	-.070	-.055	-.028	.015	.030	.002	-.010	.010	-.052	.192	.230	.064	.199	.255	.267	.404	.334	1			
21 Teacher Collaboration	-.223	-.218	.163	-.032	-.079	.111	.071	.200	-.152	.172	.143	.372	.290	.341	.518	.233	.274	.129	.252	.250	1		
22 Job Satisfaction	-.058	-.052	-.145	-.056	-.082	-.059	-.135	-.136	.152	-.100	-.137	.332	.326	.214	.328	.324	.362	.409	.350	.284	.128	1	

Italicized correlations – p < .05

Bolded correlations – p < .01

Appendix B

Conditional Model on demographics (school and teacher)

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + \gamma_{010} * \% \text{White}_{jk} + \gamma_{020} * \text{School Size}_{jk} + \gamma_{100} * \text{Teacher Tenure}_{ijk} + \gamma_{200} * \text{White}_{ijk} + r_{0jk} + u_{00k} + e_{ijk}$$

Table 7: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	Approx. d.f.	p-value
γ_{000}	3.0771	0.012515	245.87	181	<.001
γ_{010}	0.0022	0.0006	4.040	457	<.001
γ_{020}	-0.000078	0.000022	-3.546	457	<.001
γ_{100}	-0.00728	0.000866	-8.409	6919	<.001
γ_{200}	-0.21689	0.037571	-5.773	6919	<.001

Table 8: Variance components

	Unconditional VC	Conditional VC	Pseudo R^2
District	0.00582	0.00330	43.3%
School	0.02049	0.02003	2.2%
Teacher	0.45779	0.45228	1.2%

Appendix C

Conditional Model on demographics (school and teacher) and school climate

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + \gamma_{010} * \% \text{White}_{jk} + \gamma_{020} * \text{School Size}_{jk} + \gamma_{030} * \text{Teacher Principal Trust}_{jk} + \gamma_{040} * \text{Teacher Teacher Trust}_{jk} + \gamma_{100} * \text{Teacher Tenure}_{ijk} + \gamma_{200} * \text{White}_{ijk} + r_{0jk} + u_{00k} + e_{ijk}$$

Table 9: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	Approx. d.f.	p-value
γ_{000}	3.081836	0.011524	267.437	181	<0.001
γ_{010}	0.001863	0.000450	4.141	455	<0.001
γ_{020}	-0.000052	0.000018	-2.887	455	0.004
γ_{030}	0.192332	0.023410	8.216	455	<0.001
γ_{040}	0.133068	0.030862	4.312	455	<0.001
γ_{100}	-0.007289	0.000867	-8.409	6919	<0.001
γ_{200}	-0.213926	0.038101	-5.615	6919	<0.001

Table 10: Variance components

	Unconditional VC	Conditional VC	Pseudo R ²
District	0.00582	0.00358	38.5%
School	0.02049	0.00874	57.3%
Teacher	0.45779	0.45108	1.5%

Appendix D

Conditional Model on demographics (school and teacher), school climate, and school implementation of EE

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + \gamma_{010} * \% \text{White}_{jk} + \gamma_{020} * \text{School Size}_{jk} + \gamma_{030} * \text{Teacher Principal Trust}_{jk} + \gamma_{040} * \text{Teacher Teacher Trust}_{jk} + \gamma_{050} * \text{EE Time/Resources}_{jk} + \gamma_{100} * \text{Teacher Tenure}_{ijk} + \gamma_{200} * \text{White}_{ijk} + r_{0jk} + u_{00k} + e_{ijk}$$

Table 11: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	Approx. d.f.	p-value
γ_{000}	3.077619	0.011345	271.275	181	<0.001
γ_{010}	0.001944	0.000422	4.611	454	<0.001
γ_{020}	-0.000041	0.000018	-2.354	454	0.019
γ_{030}	0.166502	0.024214	6.876	454	<0.001
γ_{040}	0.117629	0.029960	3.926	454	<0.001
γ_{050}	0.128989	0.024632	5.237	454	<0.001
γ_{100}	-0.007096	0.000852	-8.328	6919	<0.001
γ_{200}	-0.213094	0.037596	-5.668	6919	<0.001

Table 12: Variance components

	Unconditional VC	Conditional VC	Pseudo R^2
District	0.00582	0.00377	35.2%
School	0.02049	0.00688	66.4%
Teacher	0.45779	0.45094	1.5%

Appendix E

Model conditional on demographics, school climate, and teacher perception of climate

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + \gamma_{010} * \% \text{White}_{jk} + \gamma_{020} * \text{School Size}_{jk} + \gamma_{030} * \text{Teacher Principal Trust}_{jk} + \gamma_{040} * \text{Teacher Teacher Trust}_{jk} + \gamma_{050} * \text{Time/Resources}_{jk} + \gamma_{100} * \text{Teacher Tenure}_{jk} + \gamma_{200} * \text{Teacher Principal Trust}_{ijk} + \gamma_{300} * \text{Teacher Teacher Trust}_{ijk} + \gamma_{400} * \text{White}_{ijk} + r_{0jk} + r_{2jk} * \text{Teacher Principal Trust}_{ijk} + u_{00k} + e_{ijk}$$

Table 13: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	Approx. d.f.	p-value
γ_{000}	3.079871	0.011431	269.429	181	<0.001
γ_{010}	0.001663	0.000432	3.853	453	<0.001
γ_{020}	-0.000051	0.000017	-2.907	453	0.004
γ_{030}	0.167746	0.024387	6.878	453	<0.001
γ_{040}	0.112783	0.030319	3.720	453	<0.001
γ_{050}	0.147645	0.023179	6.370	453	<0.001
γ_{100}	-0.003082	0.000815	-3.782	6277	<0.001
γ_{200}	0.312333	0.013133	23.782	453	<0.001
γ_{300}	0.152274	0.017202	8.852	6277	<0.001
γ_{400}	-0.194325	0.032848	-5.916	6277	<0.001

Table 14: Correlations of random effect terms

	INTRCPT1, π_0	Teacher Principal Trust, π_2
INTRCPT1, π_0	1	
Teacher Principal Trust, π_2	-0.778	1

Table 15: Variance components

	Unconditional VC	Conditional VC	Pseudo R^2
District	0.00582	0.00366	38.7%
School	0.02049	0.01312	36.0%
Teacher	0.45779	0.36859	19.5%

Appendix F

Model conditional on demographics and school trust and teacher perceptions of trust and EE feedback process

$$\text{Job Satisfaction}_{ijk} = \gamma_{000} + \gamma_{010} * \% \text{White}_{jk} + \gamma_{020} * \text{School Size}_{jk} + \gamma_{030} * \text{Teacher Principal Trust}_{jk} + \gamma_{040} * \text{Teacher Teacher Trust}_{jk} + \gamma_{050} * \text{Time/Resources}_{jk} + \gamma_{100} * \text{Teacher Tenure}_{jk} + \gamma_{200} * \text{Time/Resources}_{ijk} + \gamma_{300} * \text{Feedback Use}_{ijk} + \gamma_{400} * \text{Opportunity to Use Feedback}_{ijk} + \gamma_{500} * \text{Feedback Accuracy}_{ijk} + \gamma_{600} * \text{Teacher Principal Trust}_{ijk} + \gamma_{700} * \text{Teacher Teacher Trust}_{ijk} + \gamma_{800} * \text{White}_{ijk} + r_{0jk} + r_{6jk} * \text{Teacher Principal Trust}_{ijk} + u_{00k} + e_{ijk}$$

Table 16: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	Approx. d.f.	p-value
γ_{000}	3.078772	0.011465	268.535	181	<0.001
γ_{010}	0.001673	0.000463	3.615	453	<0.001
γ_{020}	-0.000048	0.000018	-2.714	453	0.007
γ_{030}	0.137341	0.024546	5.595	453	<0.001
γ_{040}	0.111117	0.030860	3.601	453	<0.001
γ_{050}	0.085383	0.024127	3.539	453	<0.001
γ_{100}	-0.001489	0.000800	-1.861	6273	0.063
γ_{200}	0.077867	0.012377	6.291	6273	<0.001
γ_{300}	0.024303	0.008037	3.024	6273	0.003
γ_{400}	0.077090	0.011033	6.987	6273	<0.001
γ_{500}	0.028055	0.009673	2.900	6273	0.004
γ_{600}	0.231527	0.013325	17.375	453	<0.001
γ_{700}	0.128312	0.015986	8.026	6273	<0.001
γ_{800}	-0.166713	0.032824	-5.079	6273	<0.001

Table 17: Correlations of random effect terms

	INTRCPT1, π_0	Teacher Principal Trust, π_2
INTRCPT1, π_0	1	
Teacher Principal Trust, π_2	-0.765	1

Table 18: Variance components

	Unconditional VC	Conditional VC	Pseudo R^2
District	0.00582	0.00336	42.3%
School	0.02049	0.01449	29.9%
Teacher	0.45779	0.35400	22.6%