

RESEARCH ARTICLE

## The Impact of Work Environment and Teacher Attributes on Teacher Job Satisfaction

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### ABSTRACT

**Background/purpose** – Teachers play a critical role in student learning processes and in their academic success, and as such their job satisfaction directly impacts upon their teaching efficacy and lecture quality. In light of the importance of job satisfaction in educational practice, this study investigates the impact of work environment factors and personal attributes on teachers' job satisfaction.

**Materials/methods** – This study utilizes data from the 2019 TIMSS (Trends in International Mathematics and Science Study) for eighth-grade science teachers from the United States.

**Results** – Teacher job satisfaction showed a strong association with the majority of work environment factors and professional development factors, whilst no significant relationship was found with teacher background.

**Conclusion** – Teachers' job satisfaction significantly impacts on their performance, retention, and teaching efficacy. Through analysis of the TIMSS 2019 dataset, it was seen that teacher job satisfaction is primarily affected by the environment in which they work and also their professional development. These results concur with other findings reported in the literature. However, contrary to prior works, this study revealed no association between job satisfaction and teachers' background. As a result, schools should prioritize creating a congenial work environment in order to improve teaching quality. The limitations of this research and suggestions for future work are also discussed.

**Keywords** – Teacher job satisfaction, work environment, teacher characteristics, TIMSS.

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## 1. INTRODUCTION

With advancements in technology, student competence and interest in STEM-related fields have become increasingly important. Students primarily gain their knowledge, attitude, interest, and skills from teachers; and teachers' performance, retention, and teaching efficacy depends upon their job satisfaction (Sadeghi et al., 2021). Schools with a high level of teacher job satisfaction offer quality teaching and thereby produce more academically successful students. Hence, it is important for schools to provide conditions that amplify teacher job satisfaction. This involves factors such as school safety, student discipline, teacher workload, school climate, opportunities for professional development, student behavior, and teaching practice.

There is no well-established definition of job satisfaction (Evans, 1997). The construct has included domains such as attitude, emotion, rewards, wage, job status, and working conditions (such as teaching resources, workload, collaboration between colleagues, opportunities for professional development, school climate, parental involvement, and student discipline). Zhu (2013) summarized the evolution of the term from a single-perspective definition to that of a multiperspective: between the 1930-1970s as affection, and from the 1980s as affection and cognition. In the affection domain, job satisfaction is an individual's overall positive affection towards their job. In the cognition domain, job satisfaction represents an individual's judgement on working conditions, development opportunities, and achievement. The most widely accepted definition of job satisfaction is attributed to Locke (1976) (Miller et al., 1995), which characterized the term as a positive pleasant affection resulting from an individual's appreciation of their job-related achievement or job experience (Zülfü, 2010). This includes both a worker's physiological satisfaction in their work environment as well as their attitude towards work.

In light of the importance of job satisfaction in educational practice, the current study investigates the impact of major factors that contribute towards teacher job satisfaction. The study considers the environmental factors related to challenges to teaching, instructional activities, school academic atmosphere, and school discipline and safety. Workers realize a positive congenial state when meeting their job expectations, promoting good work quality, high levels of efficiency, and strong commitment; and aspects of the work environment (such as classroom and school compositions) can help to increase teacher job satisfaction and promote their enthusiasm towards teaching. The study also considers teachers' personal attributes, which include involvement in professional development programs as well as their background in terms of their age, gender, and years of teaching experience. The objective of the current study is to empirically research the sources that impact upon teacher job satisfaction, as well as the relations and effects of these sources. With these implications in mind, the study utilizes the TIMSS (Trends in International Mathematics and Science Study) 2019 eighth-grade science teacher data from the United States in order to reveal the relationships between teacher job satisfaction, working environment, and teacher attributes.

## 2. LITERATURE REVIEW

The literature includes numerous studies on the importance of work environment related to job satisfaction. Menon and Athanasoula-Reppa (2011) identified a multitude of factors including school climate, key stakeholders, support and training, participation in school management, student/school progress, professional development, and employment terms. They reported that experienced teachers demonstrated significantly higher job

satisfaction related to the factors of key stakeholders and participation in school management. Kim and Lee (2020) revealed that principal instructional leadership had a significant impact on teachers' participation in professional development. They suggested that principals should provide more opportunities for teacher collaboration, and form professional groups where teachers can share their classroom management experiences, inspire new teaching approaches, and discuss instructional plans. Likewise, Gülbahar's study (2020) revealed that perceived supervisor support has a significant correlation with job satisfaction, school efficacy, and also work engagement. Darling-Hammond et al. (2020) concluded that the relations among teachers, parents, and schools was a key factor influencing student performance and educational outcomes. They reported that teachers' collaborative practices such as the sharing of teaching strategies, curriculum planning, opportunities for professional development, and involvement in decision-making can increase teaching efficacy and teacher retention. In a more recent study, Hsieh et al. (2022) reported that principal leadership, work environment, and the parent-teacher relationship can significantly influence teaching efficacy. García-Crespo et al. (2021) reported that academic resilience for teaching is most influenced by having a safe school environment and classroom order.

In terms of personal attributes, studies have shown that professional characteristics such as academic background, qualification, and training played a role in teachers' job satisfaction. Klassen and Chiu (2011) suggested that teachers' skills in instruction and classroom management improves their commitment to teaching. Ingersoll and May (2012) found that teachers with greater self-efficacy in classroom management and instructional strategies tend to have higher levels of job satisfaction and turnover. In an investigation of a learner-centered mentoring program, Rosenberg and An (2019) found that professional development positively affected teachers' attitudes. Sims (2020) found a strong association between teacher job satisfaction and retention that was based on whether or not teachers received sufficient training in the topics being taught, as well as career progression in the school. Maren et al. (2021) reported that teachers with high-instructional support quality, low analysis and inquiry, and high instructional dialogue exhibited a higher level of job satisfaction; and suggested that professional development should therefore be based on these factors. Smet (2022) used a multilevel technique to investigate the influence of teachers' professional development on job satisfaction, and found that teaching diversity and special needs were significant influencing factors.

In addition, studies have reported that personal background such as gender, years of teaching experience, and occupation status play a role in teachers' job satisfaction. Ma and MacMillan (1999) found that female teachers were often more satisfied with their work, and that gender differences in work satisfaction increased with teaching proficiency. In contrast, Salami et al. (2017) assessed teachers' attitudes toward interdisciplinary teaching and found that female teachers reported lower levels of teaching satisfaction and more negative attitudes towards teaching and teamwork. Liu and Ramsey (2008) found that teachers' job satisfaction showed dependence on gender, years of teaching experience, and occupational status. Klassen and Chiu (2010) also reported that female teachers tended to face greater levels of stress in terms of workload, student classroom behavior, and classroom management. In way of summary, Daryanto (2014) examined the impacts of individual characteristics, job characteristics, and career development on teachers' satisfaction and found an inverse correlation between job satisfaction and the difference among the three.

### 3. METHODOLOGY

#### 3.1 Participants

The current study is based on the examination of data from TIMSS 2019. Conducted by the International Association for the Evaluation of Educational Achievement (IEA), TIMSS is a prestigious international study that assesses fourth-grade and eighth-grade students' mathematics and science achievement on a 4-year cycle. Each TIMSS cycle includes linked questionnaires for students, teachers, and schools; with contents on (a) educational contexts, (b) student, teacher, and school characteristics, (c) home, classroom, and school environment, (d) resource availability, curricula, instructional strategies, and teacher preparation and development, and (e) students' achievements in mathematics and science (Mullis et al., 2020). The rich information collected by TIMSS provides valuable resources for educational researchers, practitioners, and policymakers to examine educational issues that may affect student performances in mathematics and science.

In TIMSS 2019, a total of 46 education systems (representing 39 countries and seven benchmarking participants) took part in the eighth-grade assessment. The TIMSS 2019 eighth-grade science teacher data for the United States was used in the current study, and consisted of 273 schools and 472 teachers. The data, results, assessment frameworks, methods, procedures, and technical reports for TIMSS 2019 are publically available from the official TIMSS 2019 website (<https://timssandpirls.bc.edu/timss2019/>).

#### 3.2 Instruments

The TIMSS responses are recorded on a scale-based construct. Scale content and reliability assessments can be found in Yin and Fishbein's (2020) report. For research consistency, the current study used scales derived from the science teacher survey, which had reliability values exceeding .80.

*Teacher job satisfaction* was rated according to the responses given to five questions: (a) "I am content with my profession as a teacher," (b) "I find my work full of meaning and purpose," (c) "I am enthusiastic about my job," (d) "My work inspires me," and (e) "I am proud of the work I do." Cronbach's alpha for the Teacher Job Satisfaction Scale was established as being .93 (Yin & Fishbein, 2020).

Factors assessed concerning the *work environment* include; (a) *Safe and orderly school*, (b) *Teaching limited by student needs*, (c) *Teachers' emphasis on science investigation*, (d) *Challenges faced by teachers*, (e) *Collaboration*, and (f) *School emphasis on academic success*. The corresponding questionnaires for these factors are as follows:

- (a) *Safe and Orderly School*: This measures teachers' perceptions of school safety and discipline, including school location, security, regulation, and student behavior. Higher values indicate a safer and more orderly school environment.
- (b) *Teaching Limited by Student Needs*: This factor includes student absence, lack of interest, failure to meet prerequisites, lack of basic nutrition, insufficient sleep, mental/emotional/psychological problems, and difficulties understanding instruction. Higher values indicate that classroom instruction is limited less by students' attributes on learning.
- (c) *Teachers' Emphasis on Science Investigation*: This assesses the instructional practices through which teachers emphasize science investigation and expose students to classroom-based experiments. The instructional strategies include observation, the design and conduct of experiments, presentation and interpretation of experimental

data, and fieldwork. Higher values indicate teachers that utilize those instructional methods more often.

- (d) *Challenges Faced by Teachers*: This factor consists of eight questions regarding: too many students in the class, too much material to cover, too many teaching hours, too many administrative tasks, needing more time to prepare for class, needing more time to assist individual students, feeling pressure from parents, and difficulty in keeping up with the curriculum. Higher values indicate that teachers face less challenges.
- (e) *Collaboration*: This factor is based on responses regarding “Collaboration between school leadership and teachers instruction plan.” Higher values indicate a more positive view held with regards to collaboration.
- (f) *School Emphasis on Academic Success*: This measure consists of 11 questions regarding teachers’ viewpoints on how teachers, parents, and students perceive the strength in which the school values academic success. To investigate the differences between these perspectives, the current study sub-divides *school emphasis on academic success* into *Emphasis by Teachers* (four questions), *Emphasis by Parents* (four questions), and *Emphasis by Students* (three questions), each as the sum of the measures of their respective questions. Higher values indicate a stronger emphasis towards academic success.

The factors related to teachers’ attributes cover both their professional development (past/future) and also their personal background (*Years of Teaching, Gender, Age, and Major*). The *Professional Development* factor is evaluated according to the amount of professional development activities that the teacher has previously participated in (*Past Professional Development*) or aims to achieve in the future (*Future Professional Development*). Examples of such activities include science content, science pedagogy or instruction, science curriculum, scientific assessment, integrating technology into science instruction, improving students’ critical thinking or inquiry skills, and addressing individual students’ needs (Fishbein et al., 2021). The factor of *Major* evaluates the number of science education areas where the teacher has expertise.

### 3.3 Procedures

Development work for TIMSS 2019 consists of four phases: (1) Work undertaken within the first 2 years (2016-2017) was used in order to update the assessment frameworks, develop the eTIMSS interface and eAssessment System, and a series of extended Problem-Solving and Inquiry (PSI) tasks; (2) Work undertaken in the third year (2018) was used to create new items, enhance PSIs, and to test the eTIMSS interface and eAssessment System; (3) A TIMSS 2019 field test was conducted from March to May of 2018 with the participating countries; and, (4) the TIMSS 2019 data was collected near the end of the school year, from September to December of 2018 for Southern Hemisphere countries, and from March to June of 2019 for Northern Hemisphere countries (Cotter et al., 2020).

### 3.4 Data analysis

The study first examined the data’s descriptive statistics (e.g., range, count, average, and standard deviation) of the *Work Conditions* and *Teacher Attribute* factors. Also compared were the values between directly-related subfactors (*Academic Success* and *Professional Development*). Subsequently, multiple regression analysis was conducted so as to investigate associations between *Teacher Job Satisfaction* and each of the other factors. The dependent variable of the study was *Teacher Job Satisfaction*, whilst the independent

variables include the factors of *Work Environment* and *Teacher Attributes*. IBM's SPSS version 20.00 was used in the analysis of the TIMSS 2019 data.

## 4. RESULTS

### 4.1 Descriptive statistics

Descriptive statistics of teacher characteristics and work conditions are presented in Table 1. Of the three subfactors of *School Emphasis on Academic Success*, it can be seen that the average emphasis on academic success by the *teachers* was the highest. Of the *Professional Development* subfactors, *Past Professional Development* was revealed as having values higher than that of *Future Professional Development*.

**Table 1.** Descriptive statistics of the variables

Variable	<i>N</i>	Number of items	Min	Max	<i>M</i>	<i>SD</i>
Years of teaching	435	1	1.000	38.000	13.244	8.790
School emphasis on academic success- Teachers	432	4	4.000	20.000	15.942	2.612
School emphasis on academic success- Parents	433	4	4.000	20.000	12.208	3.606
School emphasis on academic success- Students	430	3	3.000	15.000	9.958	2.188
Professional development-Future	410	7	7.000	14.000	10.949	2.715
Professional development-Past	417	7	7.000	14.000	11.628	2.214
Challenges faced by teachers	424	8	8.000	32.000	18.557	4.304
Teaching limited by student needs	420	8	3.624	15.295	9.340	1.678
Safe and orderly schools	430	8	4.426	13.870	9.544	2.237
Teachers' Job satisfaction	430	5	5.281	11.746	9.685	2.021
Teachers' emphasis science investigation	421	7	6.513	16.033	9.874	1.850
Collaboration	432	1	1.000	5.000	3.475	0.977

### 4.2 Regression analysis



Table 2 presents the ANOVA results of the regression analysis, whilst Table 3 presents the associations between Teacher Job Satisfaction, Work Environment, and Teacher Attributes. Most of the variables related to *Work Environment* and *Professional Development* show a strong association with *Job Satisfaction*, whereas the *Teachers' Backgrounds* are not significant.

**Table 2.** ANOVA results of regression analysis

Model	Sum of Squares	df	Mean Squares	F	p-value
Regression	436.144	8	54.518	17.913	< .001
Residual	1,190.016	391	3.044		
Total	1,626.160	399			

**Table 3.** Results of regression analysis

Variable	Coefficient	Standard Error	t-ratio	p-value
Intercept	-.600	.993	-0.605	.546
School emphasis on academic success-Students	.122	.054	2.264	.024
Teaching limited by student needs	.182	.061	2.966	.003
School emphasis on academic success-Teachers	.102	.041	2.475	.014
Professional development-Past	.116	.040	2.858	.004
Teachers' emphasis on science investigation	.146	.049	2.951	.003
Challenges faced by teachers	.054	.021	2.551	.011
Safe and orderly schools	.120	.051	2.334	.020
Professional development-Future	.076	.033	2.286	.023

A detailed examination reveals that:

High levels of *Job Satisfaction* was found to be associated with most *Work Environment* factors:

- The factors of *Teaching Limited by Student Needs* and *Teachers' Emphasis on Science Investigation* are the most influential.

- The factors of *Challenges Faced by Teachers* and *Safe and Orderly Schools* were found to significantly impact upon *Job Satisfaction*.
- The subfactors of *Students' Emphasis on Academic Success* and *Teachers' Emphasis on Academic Success* were shown to be strongly associated with *Job Satisfaction*, whilst the association of *Parents' Emphasis on Academic Success* was much less.
- The factor of *Collaboration* was not found to be strongly associated with *Job Satisfaction*.

Both of the *Professional Development* subfactors were revealed to have a significant effect on *Job Satisfaction*, with *Prior Professional Development* having a slightly higher impact than *Future Professional Development*.

The *Teacher Background* factors showed no significant relationship with *Job Satisfaction*.

## 5. DISCUSSION

The results of the study confirm the strong impact on *job satisfaction* by *work environment* and *professional development* factors. However, *teachers' background* was not found to have an effect on job satisfaction. This finding contradicts earlier research regarding factors such as gender and years of experience playing an important role in job satisfaction.

Most of the *work environment* predictors included in the current study were found to be significant, for example, *safe and orderly school*, *teaching limited by student needs*, *teachers' emphasis on science investigation*, *challenges faced by teachers*, and *school emphasis on academic success* (both *students* and *teachers*). Within the *work environment* factors, teacher job satisfaction was shown to be positively associated with their perception of safety and order in schools. A sense of security comes from schools located in safe neighborhoods, with fewer student behavioral problems, clear school rules on student conduct and security policies, and where students exhibit respect for teachers and school facilities. Teachers' workload also influences their job satisfaction. Large class sizes, a heavy administrative burden, and challenges to teaching negatively impact job satisfaction. Moreover, teaching can be difficult when students are frequently absent from class, face physical or psychological problems, or lack the prerequisite knowledge necessary to learn a particular subject. In order to facilitate learning, teaching curricula should be devised according to the students' prior knowledge and capture the key elements that connect the core concepts of the subject. Creating an environment that supports individual student needs can help students to become more self-sufficient and foster motivation to learn. Developing a strong student-teacher-school relationship can help to promote teachers' sense of security and belonging, which in turn can lead to their improved job satisfaction.

Consistent with the existing literature, the current study also showed that participation in *professional development* activities has a positive association with *job satisfaction* (Maren et al., 2021; Rosenberg & An, 2019; Smet, 2022). Attending professional development activities such as conferences, workshops, and seminars can help to facilitate teachers' pedagogical skills. As a result, schools should actively encourage and provide teachers with the opportunities to undertake educational training such as curriculum and instruction planning, the application of new technologies in teaching, ways to improve administrative efficacy, and methods of building a supportive teacher-student relationship.

### 5.1 Limitations



The current study is not without its limitations. First, although TIMSS records many *work conditions* and *teacher attributes*, several high-impacting factors identified by other studies are notably absent. For example, the TIMSS teachers' questionnaire only reports on general *job satisfaction* results, but lacks detailed questions on the factors that influence it. Secondly, TIMSS is a sample-based assessment, and therefore the teachers are not selected at random, which may in turn limit the generalizability of the results in terms of the current study.

## 6. CONCLUSION

Teachers play an important role in raising students' performance, and their job satisfaction forms an essential component in their motivation to teach, self-efficacy, and retention. This study examined the relationship between teacher *job satisfaction* with *work environment* and *teacher attribute* factors using the TIMSS 2019 dataset. Descriptive statistics were examined, and regression testing conducted in order to establish any associations between the factors. The study's results indicate that teacher *job satisfaction* is strongly associated with *work environment* and *professional development*, whilst no association was found to *personal background*. As a result, schools should maximize the job satisfaction of their teaching staff by creating a congenial work environment in order to support teaching effectiveness.

## 7. SUGGESTIONS

In addition to the analysis conducted in the current study, several other research directions were also identified that are considered worthy of further investigation. First, other school-level factors such as school demographics, availability of instructional resources, and school climate are also known to influence teacher job satisfaction. Future studies could therefore combine TIMSS teacher questionnaire data with school context data in order to examine their impact on teacher job satisfaction. Second, the TIMSS dataset is hierarchical in nature (e.g., school-class-student). Multilevel modeling techniques could be applied so as to gain a more hierarchical understanding of the factors that influence teacher job satisfaction. Third, whilst job satisfaction has been shown to impact upon teachers' intention of leaving and turnover, it is not in itself a direct measure of job retention. Future research could investigate the link between job satisfaction and factors relevant to teachers' turnover and burnout. Future studies could also extend upon the current research and investigate the improvement of teacher job satisfaction.

## DECLARATIONS

**Author Contributions:** This article was written by three authors, who contributed equally to this manuscript.

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**Data Availability Statement:** Data can be obtained directly from the TIMSS website.

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