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Investigating the Relationship between 8th Grade Science Teachers' Job Satisfaction, Self-efficacy, Work Conditions, and Goal-related Supports in Finland and the United States Using TIMSS Data

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Abstract

Teacher job satisfaction has been a topic at the forefront of research because low job satisfaction leads to high attrition rates, which affect student achievement, school culture, and state and federal mandates. When teachers are satisfied in their workplace, they are more likely to be more committed to their role and effective members of the school [6]. The purpose of this study was to examine the relationship between 8th grade science teachers' job satisfaction, self-efficacy to teach science, work conditions, and their perceptions of goal support environment in Finland and the United States based on TIMMS 2011 data. Results of the study indicated that self-efficacy, work conditions, and goal-related environmental supports significantly contributed to job satisfaction in Finland, while in the United States, only work conditions were significantly correlated with job satisfaction. The data suggests that work conditions played a much greater role in teacher job satisfaction than the other two variables investigated. The results warrant further research into these correlations, as well as incite dialogue between teachers, administrators, and district officials in search of novel ways to improve teacher job satisfaction and therefore, student performance.

Keywords: *job satisfaction, self-efficacy, work conditions, TIMSS*

1. Introduction

Teacher job satisfaction is one factor that the Trends in International Mathematics and Science Study (TIMSS) collects from the Teacher Questionnaire. Locke (1976) defined *job satisfaction* as "an enjoyable or pleasurable emotional state, which is the result of the valuation of work or employment experience of a person" (p. 1304) [9]. Lent and Brown (2006) recommended a model of job satisfaction based on social cognitive career theory [8]. Six factors were included in the model: (a) work/educational satisfaction, (b) self-efficacy, (c) goals, (d) affective traits and personality, (e) work conditions, and (f) goal-related environmental support [7]. The interplay of these factors leads to job satisfaction.

In education, *self-efficacy* is the teacher's beliefs about the ability to achieve educational goals through planning, organizing and carrying out activities [11]. Skaalvik and Skaalvik (2014) showed self-efficacy was a predictor of job satisfaction. Lent and Brown (2006) attested that creating work-related goals, actively pursuing, and subsequently achieving these goals has the potential to make people feel satisfied and motivated in their jobs [8]. Under *work conditions*, teachers reported that autonomy, materials and supplies, class size, and responsiveness of students were factors of school that were positive factors in their work [2]. Lastly, support for teachers and their goals must come from the work environment, where positive organizational support helps increase the employee's personal obligation to their job to fulfill the organization's mission[10].

Using TIMSS 2011, Kahraman (2014) concluded self-efficacy and work conditions had significant influence on job satisfaction with Turkish science teachers, while work-related goal supports did not [7]. Badri, Mohaidat, Ferrandino, and El Mourand (2013) showed job satisfaction was directly related to positive affect, goal progress and work conditions [1]. Goal-related environmental supports and self-efficacy did not have a significant direct effect on job satisfaction, but were correlated with work conditions. In a study of 366 teachers, Duffy and Lent (2009) investigated the job satisfaction model and results showed that affective traits, self-efficacy, and work conditions were positively correlated with job satisfaction [5].

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2. Methods

2.1 Sample

This study used the TIMSS 2011 database of the United States (U.S.) and Finland. An un-weighted sample of 8th grade science teacher questionnaire responses was utilized from both countries.

2.2 Questionnaire

Self-efficacy (SE) was assessed by measuring five item responses to, "In teaching science to this class, how confident do you feel to do the following?" Answer choices included *very confident* (3), *somewhat confident* (2) and *not confident* (1). Work conditions (WC) were assessed by measuring four item responses to, "How would you characterized each of the following within your school?" Answer choices included *very high* (5), *high*, *medium*, *low* and *very low* (1). Goal-related environmental supports (GS) were assessed by measuring five item responses to, "How often do you have the following types of interactions with other teachers?" Answer choices included *never or almost never* (1), *2 or 3 times per month*, *1-3 times per week*, and *daily or almost daily* (4). Job satisfaction (JS) was assessed in TIMSS 2011 by asking, "How would you characterize each of the following within your school?" and having teacher rate "Teacher job satisfaction" as *very high* (5), *high*, *medium*, *low*, or *very low* (1).

2.3 Analyses

Items from the questionnaire were averaged to obtain overall means for each construct: #6B-6E for WC; #10A-10E for GS; #18A-18E for SE. To more intuitively measure teachers' WC, SE, and JS, the items were reverse scored so that higher scores reflected more satisfied teachers [3]; the order of GS scale was unchanged.

Descriptive statistics were calculated to compare variable means of each country (see Table 1). Average teacher JS in the U.S. was slightly higher than Finland, with mean values of 2.65 versus 2.64. Further, WC, GS, and SE means were also higher in the U.S.

Table 1.
Descriptive statistics for composite scores of Finland and United States

	Finland			United States		
Variables	*M*	*SD*	*N*	*M*	*SD*	*N*
Job Satisfaction	2.6414	.73194	8552	2.6552	.84818	5878
Work Conditions	2.6333	.44897	8552	2.8308	.58889	5878
Work Related Goal Support	.9339	.56451	8552	1.2566	.69805	5878
Self Efficacy	1.5203	.37480	8552	1.7592	.30176	5878

Note. *M* = Mean. *SD* = Standard Deviation. *N* = number of participants.

3. Results

A multiple regression analysis was conducted to evaluate how SE, WC, and GS predicted teacher JS in Finland and the U.S. For Finland, the linear combination of WC, GS, and SE was found to be significantly predictive of teacher job satisfaction, $F(3, 8548) = 648.385$, $p < .05$. In interpreting the unstandardized coefficients, it was found that an increase in WC, SE, and GS all resulted in an increase for JS. For the U.S., the combination of predictive variables were also significantly correlated to JS, $F(3, 5874) = 1105.608$, $p < .05$. Individually, however, only an increase in WC resulted in an increase for JS, and was considered significant. Regression coefficients and standard errors can be found in Table 2.

For Finland, the Spearman's rho test revealed a statistically significant relationship between WC and JS, ($r_s[8550] = .425$, $p < .01$), GS and JS ($r_s[8550] = .153$, $p < .01$), and between SE and JS ($r_s[8550] = .217$, $p < .01$). For the U.S., the Spearman's rho test revealed a statistically significant relationship between WC and JS, ($r_s[5876] = .579$, $p < .01$), GS and JS ($r_s[5876] = .153$, $p < .01$), and between SE and JS ($r_s[5876] = .084$, $p < .01$).

Table 2.
Regression analysis of variables for Finland and United States.

	Finland				
Variables	*B*	*SE*	β	*t*	Sig.
Job Satisfaction	.682	.046		14.896	.000*
Work Conditions	.601	.017	.369	35.372	.000*
Work Related Goal Support	.097	.013	.074	7.460	.000*
Self Efficacy	.188	.020	.096	9.360	.000*
			United	States	
Variables	*B*	*SE*	β	*t*	Sig.
Job Satisfaction	.236	.061		3.844	.000*
Work Conditions	.862	.016	.599	54.120	.000*
Work Related Goal Support	.019	.013	.015	1.419	.156
Self Efficacy	-.026	.030	-.009	-.854	.393

Note. B = unstandardized beta. *SE* = standard error. β = standardized beta. *t* = t-test statistic.
* $p < .05$.

The multiple correlation coefficient (R) for Finland was .431, indicating that approximately 18.5% (R-square) of the variance in teacher JS can be accounted for by the linear combination of SE, WC, and GS. The R-square value for the U.S. was .361, indicating that 36.1% of the variance for JS was explained by the predictor variables. The Finland value was indicative of a small effect size, according to Cohen (1998) classification, while the U.S. value indicated a moderate effect size [4]. Tests to see if the data met the assumption of collinearity indicated that multi-collinearity was not a concern (WC, Tolerance = .877, VIF = 1.141; GS, Tolerance = .957, VIF = 1.045; SE, Tolerance = .902, VIF = 1.109).

4. Significance of the Study

The study investigated a job satisfaction model using the factors of self-efficacy, work conditions and goal-related environment supports in relation to job satisfaction in the U.S. and Finland. SE was investigated as how confident teachers feel about teaching science, WC were examined as how teachers characterize factors at their school related to academic success, GS were explored as to how frequently teachers collaborate to improve. Based on the results, positive correlations existed between all three factors and overall feelings of satisfaction in their present job. These results support previous findings from Kahraman (2014), which stated self-efficacy and work conditions are predictors of job satisfaction, but showed that goal-related environmental supports was also a predictor; this was previously shown to not be significant [1, 7]. The data suggests work conditions played a much greater role in teacher job satisfaction than the other two variables researched.

For Finland, all three factors resulted in significant unit increases in job satisfaction. In the U.S., only WC resulted in a significant unit increase in JS, yet all three factors attributed for 36.1% of job satisfaction. Self-efficacy, work conditions, and goal-related environmental supports accounted for almost twice as much in the U.S. than Finland. Further research should examine factors accounting for this difference.

One limitation is that these estimates were not given appropriate weights and therefore, caution should be taken when interpreting. While the samples are large, they are not representative of the total number of teachers in Finland or the United States. Though the statistical significance between the three variables investigated and teacher job satisfaction varied, there was a positive correlation between them. Additional research should be conducted on these relationships and the two factors of affective traits/personality and goals, which were not provided in the data of countries with reported high teacher job satisfaction.

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