

# **A Cross-National Analysis of Teacher Collaborative Learning and School Support Structure**

## **Abstract**

Teacher collaborative learning (TCL) has become one of the large-scale innovations to drive fundamental changes in teaching and learning. Only one previous study compared the frequency of teacher participation in TCL cross-nationally and no previous studies have examined how school support structure is associated with teachers' engagement in TCL across different educational systems. Using the survey data from nationally representative samples of principals and teachers from 46 educational systems in 2018 TALIS, we found a major cross-national variation in the frequency of teachers' participation in TCL. Moreover, in more than half of the educational systems, principal instructional leadership may play an important role in promoting TCL, while teacher instructional and non-instructional workload may not decrease teacher participation in TCL.

Descriptors: Teacher Education, School Organization, Cross-Culture Studies  
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## **Purpose**

During the past two decades, a growing number of countries have developed and implemented large-scale teacher professional development reforms in an attempt to improve teaching and student learning nationwide. These large-scale reforms are influenced by the global forces such as international agencies (e.g., OECD) which produced reports on national conditions and needs of teachers (OECD, 2018, 2019) and international student assessment rankings (e.g., PISA, TIMSS) which compare their student's academic outcomes with those of perceived economic competitors around the globe (Meyer & Benavot, 2013; Robertson, 2012; Sellar & Lingard, 2013). Moreover, the global trend of neoliberal principles promoting accountability and standardization also requires professional development to go beyond simply supporting teachers' acquisition of new knowledge and skills (Akiba & LeTendre, 2009; Paine & Zeichner, 2012).

Fueled by the new roles that teachers should take within a climate of increasing global competition and accountability, teacher collaborative learning (TCL) has become one of the large-scale innovations to drive fundamental changes in teaching and learning (Boeskens et al., 2020; Huffman et al., 2016). Among many TCL models, Professional Learning Communities (PLCs) and lesson study are very influential and have spread to many countries (Huffman et al., 2016; Lewis & Lee, 2018; Stoll et al., 2006; Vescio et al., 2008). Although models of TCL have been explained by many researchers (Newmann et al., 1996; Stoll et al., 2006; Westheimer, 1998), what is common in these explanations is that teachers share the goal of improving student learning and engage in collaborative inquiry into teaching and student learning to

achieve the goal.

Although TCL is a promising approach to improving teacher instruction and student learning, only one study conducted by Akiba et al. (2019) compared the frequency of teacher participation in TCL cross-nationally using the TALIS 2013 data. No previous studies have examined how school support structure is associated with teachers' engagement in TCL across different educational systems. To fill this knowledge gap, this comparative study used survey data from nationally representative samples of principals and teachers from 46 educational systems that participated in the Teaching and Learning International Survey (TALIS) in 2018 to address the following questions:

1. How does the frequency of teachers' participation in teacher collaborative learning (TCL) differ across 46 educational systems?
2. How are three elements of school support structure— teacher instructional workload, teacher non-instructional workload, and principal instructional leadership— associated with the frequency of TLC in these educational systems and how do the relationships differ cross-nationally?

### **Background and Context**

This study is guided by the conceptual model in Figure 1 showing the hypothesized relationships between school support structure and the frequency of teachers' participation in TCL, controlling for the teacher and school background characteristics (i.e., female, teaching experience, teacher education level, school poverty, and school location) which might influence teachers' participation in TCL.

[Figure 1]

We hypothesize that teacher instructional and non-instructional workload is negatively associated with the frequency of teachers' participation in TCL while principal instructional leadership is positively associated with the frequency of teachers' participation in TCL, controlling for the teacher and school background characteristics listed in the conceptual model.

Heavy instructional and non-instructional workload of teachers is a major barrier to their engagement in TCL since it restricts teachers' time to engage in continuous professional learning. Previous studies have shown that lighter instructional loads in Japan support continuous participation in lesson study (Akiba & LeTendre, 2009), while the heavy instructional load of U.S. teachers does not allow them to engage in a continuous inquiry process of lesson study without additional funding for release time and substitutes (Akiba, 2016; Murata, 2011; Yoshida, 2012). Moreover, previous studies have also found that increased instructional hours and non-instructional hours (e.g., student counseling, extracurricular activities, administrative work) in the time of accountability limited teachers' time for professional learning in Ireland (Sugrue, 2011), Singapore (Hairon & Dimmock, 2012), Mexico (Fahara et al., 2015), and Malaysia (Joseph, 2017).

Furthermore, although school principals have various roles and responsibilities for promoting teacher professional learning (Bryk et al., 1993; Wiseman, 2003), principal instructional leadership is particularly of interest in this study because previous studies have revealed its important role in enhancing teachers' participation in TCL. For example, Zheng et al. (2016) conducted a survey of 215 primary school teachers in Southwestern China and found that principal support of teacher collaboration was associated with teacher participation level of PLC, mediated by trust among teachers. Based on a mixed-methods study of teacher survey and interviews in 71 villages in rural Gansu Province in China, Sargent and Hannum (2009) found that principal support of teacher collaboration and instructional improvement was associated with teacher collaborative lesson planning. Other single-country studies have also shown that principal instructional leadership such as pedagogical support, providing feedback to teachers after observations, placing a priority on teacher collaboration, and making professional development plan was important to teachers' participation in professional learning in Indonesia (Lim et al., 2020), Japan (Doig & Groves, 2011), and the U.S. (Coburn 2001; Youngs & King, 2002).

## **Method**

### **Data and Sample**

We used data from the 2018 TALIS administered by OECD. Since 2008, OECD has gathered TALIS survey data from nationally representative samples of principals and teachers in lower secondary schools every 5 years. TALIS use a two-stage stratified cluster sampling method where schools are first selected, and then teachers are randomly selected within schools. In this study, we focused on 46 educational systems that provided teacher survey data on TCL of lower secondary teachers. For the analysis on the relationship between school support structure and the frequency of teacher participation in TCL, we used data from 40 out of 46 educational systems that also provided principal and teacher survey data on school support structure and school/teacher background information.

In these 46 educational systems, the number of teachers who participated in the teacher survey ranged from 1,077 in Alberta, Canada to 8,648 in UAE with an international average of 3,276 teachers, and the number of principals who participated in the school survey ranged from 58 in Malta to 521 in UAE with an international average of 197 principals. All the survey questions, items, and coding are explained in Appendix A. National mean teacher instructional workload, teacher non-instructional workload, and principal instructional leadership are presented in Appendix B.

### **Analytic Strategies**

To adjust for unequal probability of selection due to multi-level complex sampling, we used a teacher weight in all the statistical analyses. To address the first question, national mean

frequencies of teacher engagement in five TCL activities were computed for each of 46 educational systems and the frequencies were compared across these systems. An overall measure of TCL was also computed by taking the mean frequency of these five TCL activities.

To address the second question, a multiple regression analysis at teacher level was conducted to find the relationship between three elements of school support structure and the frequency of TCL participation for each of 40 educational systems. In this analysis, a factor score of five TCL items was created based on a principal component analysis (PCA) with the mean of 0 and standard deviation of 1 and analyzed as the dependent variable. We used composite variables of teacher report of their instructional workload and non-instructional workload measured by number of hours per week and principal report of frequency of their instructional leadership activities (a factor score based on 6 items) as the independent variables.

Teacher and school background characteristics (i.e., female, teaching experience, teacher education level, school poverty, and school location) were included as control variables. After conducting the multiple regression analyses for 40 educational systems, I compared the size of the coefficients for each independent variable across these educational systems.

## **Results**

### **Participation in Teacher Collaborative Learning**

Table 1 shows the national mean of five TCL activities for each of 46 educational system as well as the international mean across these systems. We can see from the international mean that that, across the 46 educational systems, discussing student learning is the most common, with the international mean of 17.9 times a year, followed by exchanging teaching materials (14.2 times per year), ensuring common standards for student assessment (12.9 times), and taking part in collaborative professional learning (8.1 times). Observing instruction with feedback is the least common with only 4.6 times per year on average. When we look at the composite variable of mean of five TCL activities, across 46 educational systems, the frequency of participating in TCL in general is 11.5 times per year.

Moreover, Table 1 also reveals a major cross-national variation in each of five activities of TCL and the composite variable. On average, the frequency of participating in the mean of five TCL activities varied from 17.2 times per year in Kazakhstan to 6.8 times per year in Hungary.

[Table 1]

### **School Support Structure and Teacher Collaborative Learning**

Table 2 shows multiple regression results. In 24 (60%) out of 40 educational systems, teacher instructional workload has a significant and positive association with the frequency of teachers' participation in TCL while only Netherland shows a significant and negative association. The coefficient between teacher instructional workload and the frequency of TCL participation

ranges from -.008 in Netherland to .015 in Finland. The relationship is especially strong in Finland, Norway, and Austria with the coefficients of .015, .013, and .011 respectively.

In 29 (73%) educational systems, teacher non-instructional workload has a significant and positive association with the frequency of teachers' participation in TCL while only Slovenia shows a significant and negative association. The coefficient between teacher non-instructional workload and the frequency of TCL participation ranged from -.005 in Slovenia to .039 in Finland. The relationship was especially strong in Finland, Romania, and Estonia with the coefficients of .039, .022, and .020 respectively.

The results of teacher instructional and non-instructional workload are inconsistent with our hypothesis that teacher workload might decrease their participation in TCL in a majority of countries. It could be that teachers in low-achieving schools are assigned heavier workload and also required to participate in TCL as part of the accountability system for improving student achievement (Schleicher, 2014).

The findings of principal instructional leadership confirmed our hypothesis in 23 (58%) out of 40 educational systems. In these 23 educational systems, principal instructional leadership has a significant and positive association with participation in TCL while only Netherland shows a significant and negative association. The coefficient between the principal instructional support and the frequency of TCL participation ranged from -.108 in Netherlands to .123 in Denmark. The relationship was especially strong in Denmark, Mexico, and Chile with the coefficients of .123, .115, and .102 respectively.

[Table 2]

## **Conclusions and Implications**

Our cross-national study revealed that teachers' observation of their peers' instruction with feedback is the least common activity of TCL though previous studies have demonstrated its importance in changing teacher beliefs and practice in lesson study and other forms of TCL (Clark & Hollingsworth, 2002; Cohen & Ball, 2001; Opfer & Pedder, 2011). The major variation in the frequency of teacher participation in TCL across 46 educational systems provides educational policymakers in each system with useful information on the global trend and where they stand in comparison to other systems.

This study confirmed our hypothesis in 23 (58%) out of 40 educational systems that principal instructional leadership has a significant and positive association with TCL. It indicates that, in more than half of the educational systems we analyzed, principals' actions toward supporting teachers' instructional improvement may play an important role in promoting TCL. However, the preliminary findings from this study may indicate that teacher instructional and non-instructional workload may not decrease their participation in TCL. Future analyses will be conducted to control school achievement as a potential factor explaining the unexpected positive relationship between teacher workload and the frequency of participation in TCL.

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**Figure 1:** Conceptual Model of School Support Structure, Teacher Collaborative Learning, and Teacher/School Background Characteristics

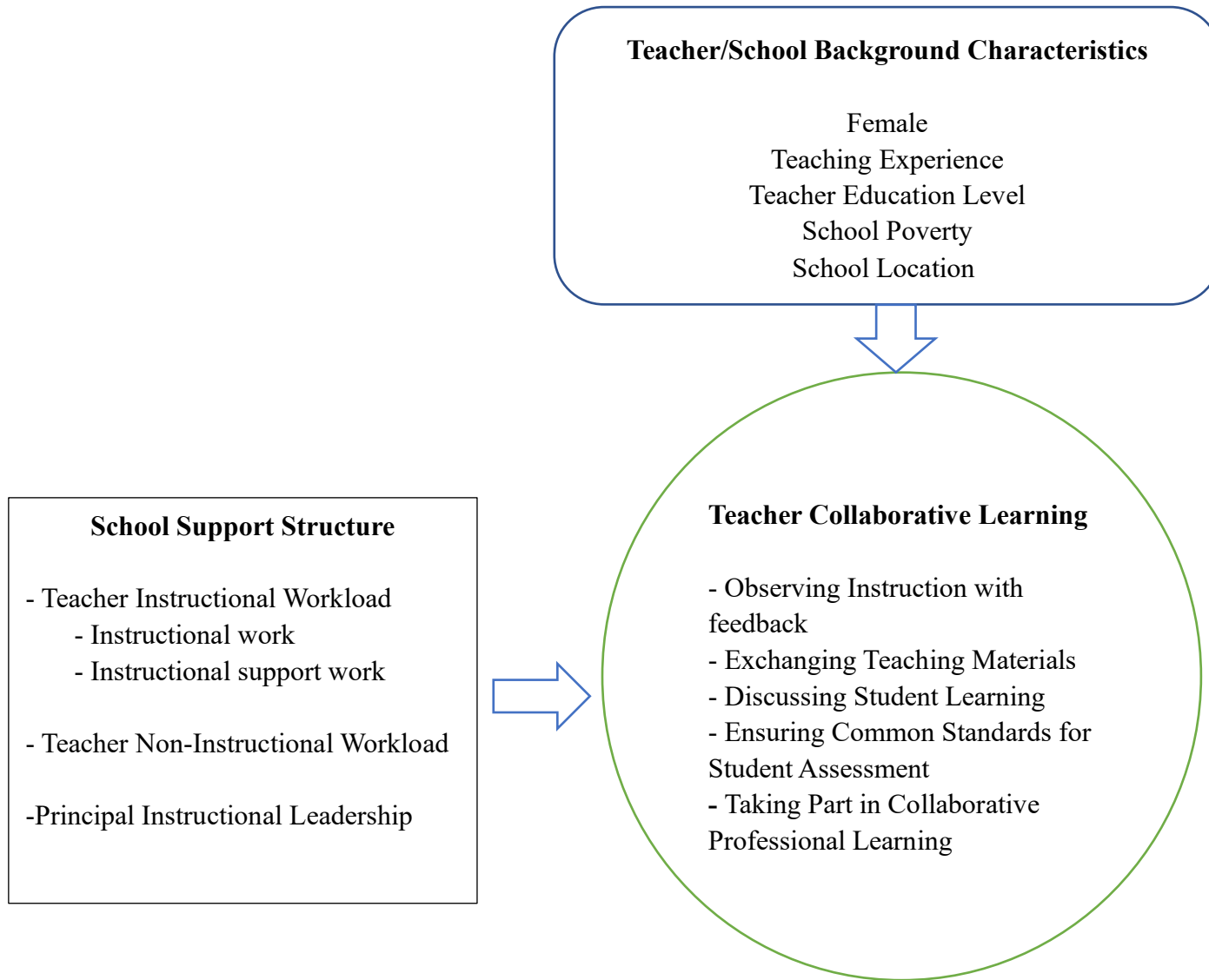




Table 1: Teacher Collaborative Learning in 46 Educational Systems

Observing Instruction with Feedback			Exchanging Teaching Materials			Discussing Student Learning		
1	Viet Nam	19.7	1	Australia	24.8	1	Norway	28.3
2	Kazakhstan	17.1	2	England (UK)	22.0	2	Sweden	26.1
3	Shanghai (China)	12.1	3	Austria	21.6	3	Australia	25.1
4	UAE	9.0	4	Norway	20.9	4	New Zealand	24.0
5	Georgia	8.6	5	New Zealand	19.9	5	Spain	23.6
6	Italy	8.2	6	UAE	19.5	6	England (UK)	23.3
7	Russia	6.8	7	Kazakhstan	19.4	7	Alberta (Canada)	23.1
8	Japan	6.4	8	Cyprus	19.2	8	Finland	22.7
9	Sweden	5.2	9	Viet Nam	19.1	9	Austria	22.3
10	England (UK)	5.0	10	Israel	19.0	10	Czech Republic	22.3
11	New Zealand	4.9	11	Singapore	18.7	11	United States	22.2
12	Singapore	4.7	12	Sweden	17.6	12	Kazakhstan	22.1
13	Australia	4.6	13	Shanghai (China)	17.4	13	Russia	21.7
14	Saudi Arabia	4.6	14	Denmark	17.0	14	Estonia	21.6
15	Romania	4.3	15	Portugal	16.9	15	Italy	21.5
16	Norway	4.2	16	United States	16.4	16	Slovenia	21.4
17	Turkey	4.2	17	Alberta (Canada)	16.1	17	Denmark	21.1
18	Denmark	4.1	18	Slovenia	16.0	18	Israel	20.4
19	Latvia	4.1	19	Belgium	16.0	19	Cyprus	20.3
20	Korea	4.0	20	South Africa	15.5	20	UAE	20.0
21	Colombia	3.9	21	Italy	14.9	21	Romania	19.6
22	South Africa	3.9	22	Japan	14.8	22	Singapore	19.6
23	Austria	3.7	23	Spain	14.0	23	Latvia	19.3
24	Hungary	3.5	24	Malta	13.7	24	Bulgaria	19.2
25	Czech Republic	3.5	25	Slovak Republic	13.4	25	Malta	17.7
26	Netherlands	3.3	26	Netherlands	13.1	26	Portugal	17.1
27	Chinese Taipei	3.1	27	Finland	12.8	27	Croatia	16.5
28	Lithuania	3.1	28	Czech Republic	12.6	28	Buenos Aires (Argentina)	15.7
29	Alberta (Canada)	3.1	29	Bulgaria	12.5	29	Japan	15.3
30	United States	3.0	30	Chile	11.9	30	Brazil	15.2
31	Slovak Republic	2.8	31	Colombia	10.8	31	South Africa	14.9
32	Portugal	2.8	32	Georgia	10.5	32	Colombia	14.5
33	Buenos Aires (Argentina)	2.8	33	Turkey	10.4	33	Belgium	14.1
34	Bulgaria	2.8	34	Romania	10.1	34	Chile	13.8
35	Mexico	2.7	35	Latvia	10.0	35	Turkey	13.6
36	Cyprus	2.7	36	Brazil	10.0	36	Mexico	13.5
37	Israel	2.7	37	Buenos Aires (Argentina)	9.8	37	Netherlands	13.3
38	Estonia	2.5	38	Russia	9.4	38	Saudi Arabia	12.3
39	Chile	2.5	39	Estonia	9.1	39	Lithuania	11.5
40	Finland	2.4	40	Hungary	8.8	40	Korea	11.5
41	Brazil	2.4	41	Lithuania	8.6	41	Slovak Republic	11.3
42	Spain	2.0	42	Croatia	8.6	42	Chinese Taipei	11.2
43	Belgium	1.7	43	Saudi Arabia	8.5	43	Georgia	10.5
44	Malta	1.6	44	Mexico	8.2	44	Hungary	10.1
45	Slovenia	1.3	45	Korea	7.7	45	Shanghai (China)	9.7
46	Croatia	0.9	46	Chinese Taipei	7.6	46	Viet Nam	7.3
<b>International Mean</b>	<b>4.6</b>		<b>International Mean</b>	<b>14.2</b>		<b>International Mean</b>	<b>17.9</b>	

Table 1: Teacher Collaborative Learning in 46 Educational Systems (Continued)

Ensuring Common Standards for Student Assessment			Taking Part in Collaborative Professional Learning			Mean of Five TCL Activities		
1	Norway	18.3	1	Shanghai (China)	18.3	1	Kazakhstan	17.2
2	Australia	18.2	2	UAE	16.7	2	Australia	17.0
3	UAE	18.0	3	Singapore	14.9	3	Norway	17.0
4	Kazakhstan	17.6	4	New Zealand	14.0	4	UAE	16.6
5	Israel	17.5	5	Sweden	13.8	5	Sweden	16.0
6	Sweden	17.2	6	Norway	13.2	6	New Zealand	15.7
7	Romania	17.1	7	Saudi Arabia	12.7	7	Singapore	14.9
8	Singapore	16.8	8	Australia	12.4	8	England (UK)	14.6
9	Cyprus	16.8	9	United States	11.3	9	Shanghai (China)	14.1
10	New Zealand	15.6	10	Turkey	10.0	10	Israel	13.9
11	Spain	15.2	11	Alberta (Canada)	10.0	11	Viet Nam	13.4
12	Czech Republic	15.2	12	Israel	9.9	12	Austria	13.4
13	Russia	15.0	13	Mexico	9.9	13	United States	13.3
14	Slovenia	14.7	14	Kazakhstan	9.8	14	Alberta (Canada)	13.1
15	South Africa	14.6	15	Brazil	9.4	15	Italy	12.9
16	Malta	14.2	16	Georgia	9.3	16	Cyprus	12.8
17	Austria	14.0	17	England (UK)	8.9	17	Spain	12.4
18	England (UK)	13.7	18	Chile	8.6	18	Slovenia	12.4
19	Bulgaria	13.7	19	Slovenia	8.4	19	Czech Republic	12.3
20	United States	13.6	20	Czech Republic	8.1	20	Denmark	12.0
21	Italy	13.5	21	Viet Nam	8.1	21	Russia	11.9
22	Portugal	13.4	22	Bulgaria	7.5	22	Romania	11.2
23	Alberta (Canada)	13.3	23	Spain	7.3	23	Bulgaria	11.2
24	Estonia	13.1	24	Colombia	7.1	24	South Africa	10.8
25	Shanghai (China)	13.0	25	Estonia	7.1	25	Finland	10.7
26	Viet Nam	12.8	26	Russia	6.8	26	Estonia	10.7
27	Latvia	12.2	27	Netherlands	6.7	27	Portugal	10.6
28	Brazil	12.2	28	Chinese Taipei	6.6	28	Malta	10.5
29	Turkey	12.2	29	Italy	6.4	29	Latvia	10.3
30			30	Buenos Aires (Argentina)	5.9	30	Turkey	10.1
31	Denmark	12.2						
31	Finland	11.7	31	Lithuania	5.6	31	Georgia	9.9
32	Slovak Republic	11.0	32	Latvia	5.6	32	Brazil	9.8
33	Buenos Aires (Argentina)	10.9	33			33		
34	Mexico	10.6		Denmark	5.5		Japan	9.7
35	Georgia	10.5	34	Malta	5.4	34	Chile	9.5
36	Colombia	10.4	35	Hungary	5.4	35	Saudi Arabia	9.4
37	Chile	10.4	36	Cyprus	5.3	36	Colombia	9.4
38			37	South Africa	5.3	37	Netherlands	9.2
38			38			38	Buenos Aires (Argentina)	9.0
39	Croatia	10.2		Korea	5.0			
39	Netherlands	9.6	39	Austria	5.0	39	Mexico	9.0
40	Saudi Arabia	9.1	40	Romania	4.9	40	Belgium	8.6
41	Belgium	8.7	41	Croatia	4.8	41	Croatia	8.2
42	Japan	8.4	42	Finland	3.8	42	Slovak Republic	8.0
43	Lithuania	7.6	43	Japan	3.7	43	Lithuania	7.3
44	Chinese Taipei	6.8	44	Portugal	2.9	44	Chinese Taipei	7.0
45	Korea	6.6	45	Belgium	2.3	45	Korea	7.0
46	Hungary	6.2	46	Slovak Republic	1.2	46	Hungary	6.8
<b>International Mean</b>		<b>12.9</b>	<b>International Mean</b>		<b>8.1</b>	<b>International Mean</b>		<b>11.5</b>

Table 2: Multiple Regression Analysis for 40 Educational Systems

Country	Instruct ional Worklo ad	Non- Instruct ional Worklo ad	Instruct ional Leaders hip	Female	Teacher Educat ion Level	Teachin g Experie nce	School Poverty Level	School Location	R2
<b>Positive Significant</b>	<b>24 (60%)</b>	<b>29 (73%)</b>	<b>23 (58%)</b>	<b>38 (95%)</b>	<b>3 (8%)</b>	<b>7 (18%)</b>	<b>9 (23%)</b>	<b>11 (28%)</b>	
<b>Negative Significant</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>6</b>	<b>3</b>	<b>6</b>	
<b>Non- Significant</b>	<b>15</b>	<b>10</b>	<b>16</b>	<b>2</b>	<b>33</b>	<b>27</b>	<b>28</b>	<b>23</b>	
Australia	.006*** (.001)	.000 (.001)	.041* (.020)	.179*** (.038)	-.049 (.037)	-.003 (.002)	-.022 (.018)	.179*** (.041)	.028
Austria	.011*** (.001)	.009** (.003)	.022 (.016)	.296*** (.033)	-.213*** (.017)	-.002 (.001)	.054** (.016)	-.118** (.035)	.100
Belgium	.005*** (.002)	.009*** (.002)	.024 (.015)	.187*** (.033)	-.031 (.019)	-.009*** (.001)	-.011 (.017)	.007 (.037)	.023
Brazil	.001 (.001)	.002 (.001)	.019 (.021)	.289*** (.045)	-.066 (.045)	.012*** (.002)	.051** (.017)	-.245*** (.043)	.058
Bulgaria	.003 (.002)	.006*** (.002)	.056** (.020)	.281*** (.052)	.003 (.031)	.003 (.002)	-.002 (.018)	.061 (.046)	.027
Chile	.001 (.002)	.005* (.002)	.102*** (.024)	.241*** (.049)	-.145** (.054)	.001 (.002)	.028 (.017)	-.032 (.049)	.036
Chinese Taipei	.007*** (.001)	.004*** (.001)	-.015 (.016)	.156*** (.035)	.054 (.033)	-.01*** (.002)	-.009 (.023)	.115*** (.034)	.034
Colombia	-.003 (.002)	.002 (.001)	.005 (.024)	.129** (.045)	-.145*** (.036)	-.002 (.002)	-.001 (.020)	-.151** (.048)	.020
Croatia	.007*** (.001)	.008*** (.002)	.078*** (.018)	.156*** (.043)	-.029 (.041)	.001 (.002)	.050* (.025)	.003 (.042)	.040
Cyprus	.006*** (.002)	-.002 (.002)	.037 (.026)	.240*** (.059)	-.037 (.048)	-.004 (.004)	-.024 (.031)	.001 (.058)	.027
Czech Republic	.012*** (.002)	.015*** (.002)	.012 (.018)	.421*** (.040)	-.025 (.027)	.004** (.002)	.089*** (.027)	-.027 (.041)	.070
Denmark	.007* (.003)	.005 (.003)	.123*** (.024)	.166*** (.049)	-.036 (.023)	.001 (.002)	.064 (.036)	-.001 (.065)	.031
Estonia	.008*** (.001)	.020*** (.003)	.050** (.018)	.311*** (.051)	-.007 (.022)	.001 (.001)	-.026 (.028)	.104* (.048)	.063
Finland	.015*** (.002)	.039*** (.005)	-.010 (.019)	.141*** (.040)	-.005 (.035)	.002 (.002)	.052 (.029)	.192*** (.045)	.072
Georgia	.002 (.001)	.001 (.001)	-.007 (.020)	.165** (.056)	-.019 (.024)	.000 (.002)	.005 (.023)	.019 (.046)	.007
Hungary	.003 (.002)	.015*** (.002)	-.025 (.018)	.206*** (.045)	-.102** (.037)	-.007*** (.002)	.023 (.016)	.142*** (.043)	.038
Israel	.008*** (.002)	.004* (.002)	.053* (.021)	.326*** (.053)	-.053 (.038)	-.002 (.002)	.073*** (.023)	-.038 (.048)	.051
Italy	.003 (.002)	.016*** (.002)	.021 (.018)	.130** (.042)	-.031 (.022)	-.008*** (.002)	.059* (.025)	.113** (.041)	.035
Japan	.001 (.001)	.004*** (.001)	.069*** (.018)	.125*** (.037)	.032 (.049)	-.002 (.002)	-.032 (.021)	-.129*** (.037)	.016
Kazakhstan	-.001 (.001)	.007*** (.001)	.082*** (.013)	.252*** (.029)	-.040 (.026)	.003** (.001)	.015 (.015)	-.137*** (.031)	.032
Korea	.008*** (.002)	.005* (.002)	.064*** (.019)	.338*** (.042)	.078* (.039)	-.001 (.002)	.048 (.032)	.046 (.050)	.050

Latvia	.002 (.001)	.008*** (.002)	.012 (.023)	.352*** (.072)	.067* (.033)	.002 (.002)	-.010 (.030)	.110* (.053)	.031
Lithuania	.003** (.001)	.012*** (.002)	.044** (.017)	.250*** (.046)	.045 (.032)	.005*** (.001)	.009 (.023)	.116*** (.036)	.047
Mexico	.003** (.001)	.011*** (.001)	.115*** (.020)	.084* (.038)	.014 (.022)	-.002 (.002)	-.059*** (.016)	-.029 (.039)	.052
Netherlands	-.008*** (.002)	.016*** (.003)	-.108*** (.026)	.211*** (.049)	-.021 (.034)	-.008*** (.002)	.114** (.040)	.114* (.057)	.062
Norway	.013*** (.002)	.013*** (.002)	.053** (.018)	.174*** (.037)	.055 (.032)	-.003 (.002)	.109*** (.028)	.024 (.047)	.046
Portugal	.007*** (.001)	-.002 (.002)	.046** (.017)	.384*** (.039)	-.043 (.037)	.001 (.002)	-.006 (.020)	-.014 (.047)	.043
Russian	.005*** (.001)	.006*** (.001)	.059*** (.017)	.193*** (.045)	.069** (.022)	.003* (.001)	-.034 (.023)	.047 (.033)	.037
Saudi Arabia	.002 (.001)	.002 (.001)	.022 (.024)	.142** (.047)	.071 (.058)	.001 (.003)	-.025 (.023)	-.037 (.048)	.016
Slovak Republic	.006*** (.001)	.008*** (.002)	.052** (.019)	.418*** (.049)	-.019 (.045)	.005** (.002)	-.020 (.024)	-.166** (.058)	.056
Viet Nam	-.001 (.001)	.006*** (.001)	.069*** (.017)	.258*** (.035)	-.067 (.0380)	.000 (.002)	-.102*** (.022)	-.049 (.048)	.028
Slovenia	.008*** (.002)	-.005*** (.001)	.037 (.024)	.526*** (.059)	.005 (.033)	-.006* (.002)	-.006 (.033)	.026 (.076)	.067
South Africa	-.001 (.001)	.002 (.001)	-.019 (.025)	.179*** (.049)	-.042 (.031)	-.003 (.002)	-.044* (.022)	.164** (.052)	.021
Sweden	.005* (.002)	.009* (.004)	.045* (.023)	.101* (.045)	-.005 (.023)	.003 (.002)	.022 (.026)	.071 (.046)	.013
UAE	.002** (.001)	.004*** (.001)	.029* (.012)	-.004 (.026)	.021 (.020)	.000 (.002)	-.025 (.013)	.003 (.027)	.011
Turkey	.006*** (.001)	.002 (.001)	.061*** (.016)	.265*** (.033)	-.052 (.059)	-.003 (.002)	-.016 (.017)	.058 (.034)	.032
United States	.002 (.001)	.005*** (.001)	.092*** (.022)	.253*** (.044)	-.011 (.033)	.002 (.002)	.018 (.019)	.039 (.046)	.044
England (UK)	.004* (.002)	.009*** (.002)	.017 (.022)	.159*** (.046)	-.047 (.041)	-.005 (.003)	.067** (.024)	.045 (.046)	.021
Alberta (Canada)	.001 (.002)	.011*** (.003)	.083** (.031)	-.005 (.065)	.040 (.076)	-.004 (.004)	.039 (.039)	.355*** (.065)	.072
Romania	.007*** (.001)	.022*** (.002)	.079*** (.016)	.119*** (.037)	.013 (.025)	.004* (.002)	-.025 (.016)	.037 (.038)	.054

Notes: \*p<.05, \*\* p<.01, \*\*\* p<.001 (2-tailed)

Appendix A: Variables

Variable	Survey Items	Original Coding	National Variable Coding
Teacher Instructional Workload (Instructional Work)	1. How many 60-minute hours did you spend <u>on teaching at this school</u> during your most recent complete calendar week?	Number of hours	National means of instructional work hours for all teachers
Teacher Instructional Workload (Instructional Support Work)	2. Approximately how many 60-minute hours did you spend on the following tasks during your most recent complete calendar week, in your job at this school? a. Individual planning or preparation of lessons either at school or out of school b. Marking/correcting of student work	Number of hours	National mean hours of the total of 2 items for all teachers
Teacher Non-Instructional Workload	3. Approximately how many 60-minute hours did you spend on the following tasks during your most recent complete calendar week, in your job at this school? a. Counselling students (including student supervision, mentoring, virtual counselling, career guidance and behaviour guidance) b. Participation in school management c. General administrative work (including communication, paperwork and other clerical duties) d. Communication and co-operation with parents or guardians e. Engaging in extracurricular activities (e.g. sports and cultural activities after school)	Number of hours	National mean hours of the total of 5 items for all teachers

Principal Instructional Leadership <sup>a</sup>	<p>4. Please indicate how frequently you engaged in the following activities in this school during the last 12 months</p> <p>a. I observed instruction in the classroom</p> <p>b. I provided feedback to teachers based on my observations</p> <p>c. I took actions to support co-operation among teachers to develop new teaching practices</p> <p>d. I took actions to ensure that teachers take responsibility for improving their teaching skills</p> <p>e. I took actions to ensure that teachers feel responsible for their students' learning outcomes</p> <p>f. I work on a professional development plan for this school</p>	<p>1=Never or rarely</p> <p>2=Sometimes</p> <p>3=Often</p> <p>4=Very Often</p>	<p>National mean frequencies of 6 items for all principals</p>
Teacher Collaborative Learning	<p>5. On average, how often do you do the following in this school?</p> <p>a. Observe other teachers' classes and provide feedback</p> <p>b. Exchange teaching materials with colleagues</p> <p>c. Engage in discussions about the learning development of specific students</p> <p>d. Work with other teachers in this school to ensure common standards in evaluations for assessing student progress</p> <p>e. Take part in collaborative professional learning</p>	<p>0=Never</p> <p>1=Once a year or less</p> <p>3=2-4 times a year</p> <p>7.5=5-10 times a year</p> <p>18=1-3 times a month</p> <p>36=Once a week or more</p>	<p>National mean frequencies of 5 items for all teachers</p>

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Note: <sup>a</sup> This variable was created based on principal survey responses. All the other variables are based on teacher survey responses.

Appendix B: School Support Structure in 40 Educational Systems

Teacher Instructional Workload			Teacher Non-Instructional Workload			Principal Instructional Leadership		
1	Colombia	41.0	1	Japan	19.3	1	Kazakhstan	3.3
2	United States	40.3	2	Chinese Taipei	15.6	2	UAE	3.3
3	Alberta (Canada)	39.2	3	Colombia	15.3	3	Saudi Arabia	3.1
4	Chile	38.8	4	Kazakhstan	14.8	4	Viet Nam	3.1
5	Russia	37.7	5	South Africa	14.8	5	Romania	3.1
6	South Africa	36.8	6	Korea	14.4	6	Georgia	3.0
7	UAE	36.0	7	Saudi Arabia	13.8	7	Bulgaria	3.0
8	Portugal	33.7	8	UAE	13.7	8	Chile	3.0
9	England (UK)	33.3	9	Russia	12.6	9	United States	2.9
10	Mexico	32.9	10	United States	12.3	10	Colombia	2.9
11	Viet Nam	32.9	11	Australia	12.1	11	Mexico	2.9
12	Brazil	32.2	12	Chile	11.6	12	South Africa	2.9
13	Australia	31.7	13	England (UK)	11.5	13	Croatia	2.8
14	Croatia	31.5	14	Viet Nam	11.4	14	Chinese Taipei	2.8
15	Slovenia	31.3	15	Georgia	11.0	15	Brazil	2.8
16	Latvia	31.1	16	Slovenia	10.9	16	England (UK)	2.8
17	Hungary	31.0	17	Alberta (Canada)	10.6	17	Slovenia	2.8
18	Austria	31.0	18	Cyprus	10.4	18	Israel	2.8
19	Bulgaria	30.9	19	Israel	10.4	19	Russia	2.8
20	Japan	30.7	20	Hungary	9.6	20	Slovak Republic	2.8
21	Czech Republic	30.5	21	Brazil	9.5	21	Alberta (Canada)	2.8
22	Saudi Arabia	30.3	22	Mexico	9.1	22	Turkey	2.8
23	Slovak Republic	30.2	23	Bulgaria	9.0	23	Cyprus	2.8
24	Estonia	30.2	24	Turkey	8.9	24	Latvia	2.8
25	Cyprus	30.2	25	Lithuania	8.9	25	Korea	2.7
26	Turkey	30.1	26	Slovak Republic	8.8	26	Austria	2.7
27	Israel	30.1	27	Latvia	8.5	27	Lithuania	2.7
28	Lithuania	29.2	28	Czech Republic	8.4	28	Czech Republic	2.7
29	Kazakhstan	28.9	29	Netherlands	8.3	29	Australia	2.7
30	Belgium	28.8	30	Norway	8.1	30	Hungary	2.6
31	Denmark	28.7	31	Portugal	8.1	31	Italy	2.6
32	Sweden	28.7	32	Sweden	8.1	32	Netherlands	2.5
33	Finland	28.5	33	Croatia	7.6	33	Japan	2.4
34	Chinese Taipei	28.2	34	Romania	7.3	34	Sweden	2.4
35	Korea	27.2	35	Estonia	7.0	35	Finland	2.4
36	Georgia	26.7	36	Italy	6.6	36	Denmark	2.4
37	Romania	26.6	37	Denmark	6.2	37	Norway	2.4
38	Norway	26.1	38	Austria	5.6	38	Belgium	2.4
39	Netherlands	25.7	39	Belgium	5.6	39	Estonia	2.3
40	Italy	25.4	40	Finland	4.0	40	Portugal	2.3
<b>International Mean</b>	<b>31.4</b>		<b>International Mean</b>	<b>10.2</b>		<b>International Mean</b>	<b>2.8</b>	

