Examining the Relationship of Distributed Leadership and Job Satisfaction: On the Mediating Roles of Teacher Self-efficacy and Co-operation

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Abstract

Building on the relevant national and international literature, we aimed at determinining the mediating roles of teacher self-efficacy and co-operation on the relationship between teacher-perceived distributed leadership behaviours and practices of school principals and teacher job satisfaction. A mediated path analysis was conducted on the TALIS (The Teaching and Learning International Survey) 2018 dataset, including nation-wide teacher perspectives. Results revealed that (1) distributed leadership is a strong predictor of teacher job satisfaction, (2) teacher self-efficacy and co-operation positively mediated the relationship between distributed leadership and job satisfaction, and (3) the conceptual model accounted for 45% of the total variance within teacher job satisfaction. This study concluded that teachers experience enhanced job satisfaction when availed with a platform to contribute and be responsible in school decision-making processes.

Introduction

Today's competitive and data-driven supply and demand relationship as to labour force results in rapid changes (Walumbwa, Muchiri, Misati, Wu, & Meiliani, 2017). Countries are attempting to keep up with these changes by implementing educational reforms (Sun & Xia, 2018). To succeed in such a changing and developing environment, principals at all levels of educational systems are expected to improve their leadership skills (Harris, 2004, 2008). Leadership concepts that address school principals as individual principals or educational leaders have been replaced in this line, particularly in the last 20 years, by more cooperative and participative leadership models (Gronn, 2010; Hallinger & Heck, 2009; Liu & Printy, 2017; Liu, Bellibaş, & Gümüş, 2021; Spillane, 2006; Spillane, Harris, Jones, & Mertz, 2015).

As perceptions and discussions about school leadership have shifted; distributed leadership, one of the models within the scope of school effectiveness and improvement, has risen to prominence in recent years (Hartley, 2010). Studies on educational management and leadership show that distributed leadership practices of school principals have direct and indirect effects on teachers' daily practice at school, their effectiveness in the classroom, and specifically cognitive-based factors (e.g. Mayrowetz, 2008; Pietsch, Tulowitzki, & Koch, 2019; Sun & Xia, 2018; Thien, 2019). Starting from this point, distributed leadership can foster a cooperative school environment, ensuring that the school staff

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shares their knowledge and experiences with one another and work cooperatively (Gronn, 2010; Irvine, 2021; Thien & Adams, 2019; Tian, Risku, & Collin, 2016). Furthermore, distributed leadership can enhance teachers' job satisfaction by building a school climate in which teachers participate in decision-making processes at school or demonstrate leadership behaviours (Hulpia, Devos, & Rosseel, 2009; Liu & Werblow, 2019; Liu et al., 2021; Pietsch et al., 2019; Sun & Xia, 2018).

Distributed leadership model, which has attracted quite much attention in the field of educational leadership especially in the last 20 years, envisages that school leadership is not conducted only by one person at school, schools benefit from the strengths of the school staff, and shareholders at school participate in decision-making (Gronn, 2010). However, the centralist and hierarchical structure of Turkish Education System may affect school principals' leadership behaviours and practices to a great extent (Çoban, Özdemir, & Bellibaş, 2020). In this context, school principals are regarded as the sole representatives of national educational policies and implementations. At this point, the current literature still focuses on school principals as occupying a position that plays a central role in school climate (Hallinger & Heck, 2009; Price, 2012). School principals may change school outcomes by affecting the processes at schools in general rather than school-level outcomes (Hallinger & Leithwood, 1994; Leithwood, Harris, & Hopkins, 2008). The studies in the related literature point to significant positive relations between school principals' distributed leadership practices and teachers' behaviours as well as attitudes (e.g. Hulpia vd., 2009; Liu & Werblow, 2019). On the other hand, although in-school effects of distributed leadership have been investigated extensively in Western cultures such as Europe and the USA, there is a limited number of studies that address the effect of school principals' distributed leadership behaviours and practices on teachers with large samples within the context of Turkish education system (Oldac & Kondakci, 2020). Unlike other leadership models such as transformative leadership, ethical leadership or servant leadership, distributed leadership has a more settled theoretical foundation, and its wide impact has been supported by the literature on school improvement (e.g. Liu et al., 2021; Liu & Werblow, 2019; Ozdemir & Demircioglu, 2015). Considering this, the current study focuses on the effect of distributed leadership model on school processes and teachers' attitudes via teachers' perspectives.

Relying on the empirical research and the related literature, the current study aims at understanding better the scope and level of the relationships among school principals' distributed leadership behaviours and practices, teachers' self-efficacy, teacher co-operation and job satisfaction. In this context, this study seeks to answer the following two research questions:

- How are the relationships among school principals' distributed leadership behaviours, teacher self-efficacy, teacher co-operation and job satisfaction?

- Do teacher self-efficacy and teacher co-operation mediate the relationship between school principals' distributed leadership behaviours and teacher job-satisfaction?

Theoretical Perspective

We discussed the theoretical foundations of the study in this section. First, we discussed each study variable in terms of its theoretical scope and functional context in the current study, which rationalizes the current study model. The second part, on the other hand, focuses on the relations between distributed leadership model, and teachers' self-efficacy and co-operation as well the as the effect of these relationships on teachers' job satisfaction. As a result, the theoretical framework of the current study consists of 9 hypotheses, each with its own foundation.

Distributed Leadership

Schools are complex and dynamic organizations (Goldring, 1996). Traditional leadership theories are not sensitive enough to encompass the complex and dynamic nature of schools (Blase, 1991). Many researchers disagree with the assertion that a single leader can meet all of a school's needs (Harris, Leithwood, Day, Sammons, & Hopkins, 2007; Irvine, 2021; Thien & Adams, 2019), which means that it is inevitable to re-explore the nature and scope of school leadership (Harris, 2004; Harris & Lambert, 2003). Failures of high-profile school leaders and their solo administration contributed to debates about

'individual' and 'hero' solo leader models (Crawford, 2012), and these debates resulted in distributed leadership with a normative transition "from heroism to distribution" (Bush & Glover, 2014; Gronn, 2010). Studies on school leadership (Glickman, Gordon, & Ross-Gordon, 2001; Gold, Evans, Early, Halpin, & Collabone, 2002; Harris, 2004; Harris et al., 2007; Leithwood et al., 2008; Mayrowetz, 2008) also underline that distributing leadership rather than concentrating it in a single person benefits school improvement, teacher professional development, and school and student performance.

Although distributed leadership emerged as a pragmatic tool to relieve school principals who have a heavy workload (Hartley, 2010), researchers could not reach an agreement for a single definition due to the differences in describing and interpreting the concept (Bennett, Wise, Woods, & Harvey, 2003; Tian et al., 2016). Though these various definitions imply disagreement among researchers (Mayrowetz, 2008), leadership is distributed via collaborative leadership team and participatory decision-making in its most basic sense (Hulpia, Devos, Rosseel, & Vlerick, 2012; Liu et al., 2021). Relying on these two perspectives, distributed leadership can be described as 'the interaction among leaders, followers, and leadership and practices distributed among them (Spillane, 2006)' when it is considered from the first perspective. Leadership is distributed among a few people in this leadership model, while the interaction within each leader's group as well as the interaction between the leaders receive special attention (Hulpia et al., 2012). The other perspective criticizes the first perspective as it limits leadership to only a few select individuals (Lashway, 2003), and it praises participation in decision-making process to distribute leadership among all the teachers in the schooling environment (Harris, 2008; Hulpia et al., 2009; Leithwood, Mascall, & Strauss, 2009). It is a well-known fact that when teachers participate in decision-making, they embrace the decision (Evers, 1990, Kushman, 1992, as cited in Hulpia et al., 2012), while it also has a positive effect on organizational change and development (Harris, 2004, 2008; Leithwood et al., 2009). The current study approaches distributed leadership from the second perspective, which envisages including teachers in the decision-making process. Within the framework of this perspective, school leaders' distributed leadership behaviours as perceived by teachers are assessed taking the dimension of participation among stakeholders as the criterion (OECD, 2019).

Teacher Self-Efficacy

Since Bandura (1977) introduced it as a component of socio-cognitive theory, it has been the focus of numerous studies (Bandura, 1977, 1997; Tschannen-Moran, Hoy, & Hoy, 1998; Tschannen-Moran & Hoy, 2001). Self-efficacy, which has attracted the attention of social scientists as well, can be defined as individuals' belief in their ability to complete a specific task successfully (Bandura, 1997), and it focuses on the potential of actions "that can be done rather than is done" by individuals (Klassen & Chiu, 2010). Although related educational studies date back to the Coleman report (1966) and subsequent Rand research, Bandura's (1977) definition of human agency within the framework of socio-cognitive theory has matured this concept and defined its limits (Olsen, 2008; Zee & Koomen, 2016). In this context, teacher self-efficacy in education refers to teachers' belief in their capacity to achieve desired outcomes in their own teaching and students' learning (Bandura, 1997; Tschannen-Moran & Hoy, 2001). In the current study, self-efficacy is defined as "teachers' belief in effectively carrying out their teaching function" (Geijsel, Sleegers, Stoel, & Krüger, 2009).

Literature review shows that teachers with a high level of self-efficacy are resistant while working with difficult students, they continue more, they ensure a higher academic focus in class and they go on doing what they do with enthusiasm, commitment and insistence even when they face a barrier (Coladarci, 1992; Geijsel et al., 2009; Gibson & Dembo, 1984; Skaalvik & Skaalvik, 2007). Furthermore, teachers' self-efficacy is considered to influence educational practices, students' motivation and success, which in turn plays a significant role in school improvement (Klassen & Tze, 2014; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Hoy, 2001, 2007; Wheatley, 2002; Zee & Koomen, 2016; Zheng, Yin, & Liu, 2019). However, while most studies focus on the results of teachers' self-efficacy, they do not equally address the effect of interaction among school principal, colleagues and other school-related factors on teachers' self-efficacy (Fackler & Malmberg, 2016). In this context, the

current study focuses on the interaction of school principals with teachers, as well as the impact of this interaction on job satisfaction. In this line, we measured teachers' self-efficacy relying on a scale composed of three dimensions and 12 items related to teachers' self-efficacy in classroom management, instruction, and student engagement (OECD, 2019).

Teacher Co-operation

While what teachers did at school were characterized as isolated and individualistic practices in the past, co-operation among teachers has drawn attention in time to improve schools' effectivity and promote school improvement (Kelchtermans, 2006). Lieberman (1986) emphasizes in a study that a collaborative culture dominates future schools, and adds that teachers in a collaborative environment are good at identifying problems, sharing their ideas for a solution, and assessing the process through questions like "how are we doing?", in which way they find an opportunity to contribute to their professional development by conducting a kind of peer evaluation. Furthermore, he (Lieberman, 1990) defends the idea that 'each school needs to create a collaborative culture as a prerequisite for its own development', and asserts that contexts, needs, abilities and commitments at a school can vary with one single thing to stay stable (Lieberman, 1986): 'A school cannot develop unless people work together'. Studies focusing on the dynamics of schools also support this claim, and underline that co-operation among teachers has strong positive effects on their professional development, motivation, change and improvement at school (Geijsel, Sleegers, van den Berg, & Kelchtermans, 2001; Goddard, Goddard, & Tschannen-Moran 2007; Goddard, Goddard, Sook Kim, & Miller, 2015; Leithwood, 2000; Little, 1982; Silins, Mulford, & Zarins, 2002). Moreover, teacher co-operation is known to improve self-efficacy, which in turn affects school academic performance (Brownell, Yeager, Rennells, & Riley, 1997; Shachar & Shmuelevitz, 1997). The current study focuses on teacher co-operation, which is defined broadly as "experiences to share knowledge with colleagues, implying learning from one another" (Geijsel et al., 2009). In this vein, we assessed teacher co-operation using an eight-item scale and the dimensions of exchange and co-ordination among teachers, as well as professional collaboration in lessons (OECD, 2019).

Job Satisfaction

Herzberg, Mausner, and Snyderman (1959) examine job satisfaction as a global concept, and they define and measure the concept with two different aspects, which are internal (level of satisfaction with job-related features) and external (level of satisfaction with work environment). In its most general sense, Locke (1976) addresses the concept with a holistic view but from the perspective of emotions, and describes job satisfaction as 'a satisfying or positive emotional state resulting from evaluating job or job experiences. Likewise, Skaalvik and Skaalvik (2011) conceptualize teacher job satisfaction as teachers' emotional reactions to their job or teaching roles. On the other hand, Moorman (1993) claims that job satisfaction includes not only an emotional dimension but also a cognitive one. Evans (1997) also indicates that teacher job satisfaction has two main components, referring to cognitive and emotional satisfaction. While cognitive satisfaction is concerned with how satisfying an individual's job conditions are, emotional satisfaction can be defined as the satisfaction or spiritual content an individual feels with the meaningful aspects of a job as well as individual success. The current study focuses on teachers' overall job satisfaction, which includes both cognitive and emotional satisfaction. In this vein, we measured teacher job satisfaction using an eight-item scale with two dimensions: teachers' job satisfaction and teachers' job environment satisfaction (OECD, 2019), considering that the literature and the framework of the current study comply with each other.

Traditional leadership practices at schools tend to ignore emotional need of teachers, which is one of the components of teachers' job satisfaction (Leithwood & Beatty 2008). However, studies conducted at schools reveal that leadership behaviours of school principals have a significant impact on teachers' job satisfaction (Bogler, 2001; Dinham & Scott, 2000; Leithwood & Beatty, 2008; Morris & Sherman, 1981). Many studies in the literature support the notion that school principals' leadership, school culture, school principal's interactions with teachers, and teacher work environment in general affect teacher job satisfaction (Bascia & Rottmann, 2011; Johnson, Kraft, & Papay, 2012; Toropova, Myrberg, & Johansson, 2019). Furthermore, there are many other studies that address job satisfaction as a prerequisite for variables that reinforce a school's capacity, such as teacher self-efficacy (Malinen & Savolainen, 2016), organizational commitment (Porter, Steers, Mowday, & Boulian, 1974; Vandenberg & Lance, 1992; Williams & Hazer, 1986), and organizational citizenship (Bateman & Organ, 1983). In the current study, job satisfaction is the outcome of the model developed in the study, and the study specifically focuses on the effect of distributed leadership behaviours perceived by the teachers on job satisfaction. The study also aims to determine how much the mediating roles of teachers' self-efficacy and co-operation change the effect.

The Relationship among Distributed Leadership, Teacher Self-Efficacy, Teacher Co-operation and Teacher Job Satisfaction

Studies on school dynamics show that school leaders have a key role in the school improvement and performance (Chrispeels & Yep, 2004; Crowther, Ferguson, & Hann, 2009; Glickman et al., 2001; Gold et al., 2002; Harris, 2004; Hulpia et al., 2012; Leithwood et al., 2008, 2009). Most of the benefits attributed to distribute leadership, which is a variable of the current study, are about teacher development (Irvine, 2021; Thien & Chan, 2022). When leadership is distributed by a participatory decision-making process, teachers internalize the goals of the schools as their own individual goals, and the positive feelings they have also enhance their self-efficacy (Geijsel et al., 2009). Relying on the literature, we propose that distributed leadership positively affects teacher self-efficacy (Hypothesis 1). Some other studies in the literature reveal that an increase in self-efficacy also increases teachers' job satisfaction (Hallinger & Heck, 2009; Klassen & Chiu, 2010; Mascall, Leithwood, Straus, & Sacks, 2008; Van Maele & Van Houtte, 2012; Zee & Koomen, 2016). In this line, we also propose that teacher self-efficacy increases their job satisfaction (Hypothesis 3). Furthermore, the literature on distributed leadership shows that teachers' participation in decision-making has a direct positive effect on job satisfaction (Thien, 2019; Zembylas & Papanastasiou, 2005). Relying on the studies in the literature, we propose that distributed leadership has both direct and indirect positive effects on teachers' job satisfaction (Hypotheses 5-6). Moreover, distributed leadership is known to encourage teachers to collaborate (Halverson, Kelley, & Shaw, 2014; Silins et al., 2002), while teacher co-operation increases their self-efficacy (Brownell et al., 1997; Shachar & Shmuelevitz, 1997), which in turn increases teachers' job satisfaction and contributes to their professional development (Zee & Koomen, 2016; Zheng et al., 2019). Accordingly, we propose that distributed leadership positively affects teacher co-operation (Hypothesis 2), which in turn increases teachers' job satisfaction (Hypothesis 4). In fact, all these studies indicate that distributed leadership puts an emphasis on the need for school principals to develop a vision for the ultimate purpose of creating a strong organizational capacity and strengthening teachers professionally (Liu & Printy, 2017). However, distribution of leadership by school principals does not necessarily mean organizational development (Harris et al., 2007). How leadership is distributed, why it is distributed and how teachers are affected by the process can change the organizational capacity as well as the content of the study, and differentiate its effects. Because of that reason, we included teachers' gender, level of education and professional experience in the model in order to control the potential effects on job satisfaction. In this line, we propose that teachers' gender (Hypothesis 7), professional experience (Hypothesis 8) and level of education (Hypothesis 9) affect their job satisfaction. The conceptual model of the variables of the current study developed relying on the current literature is given in Figure 1.
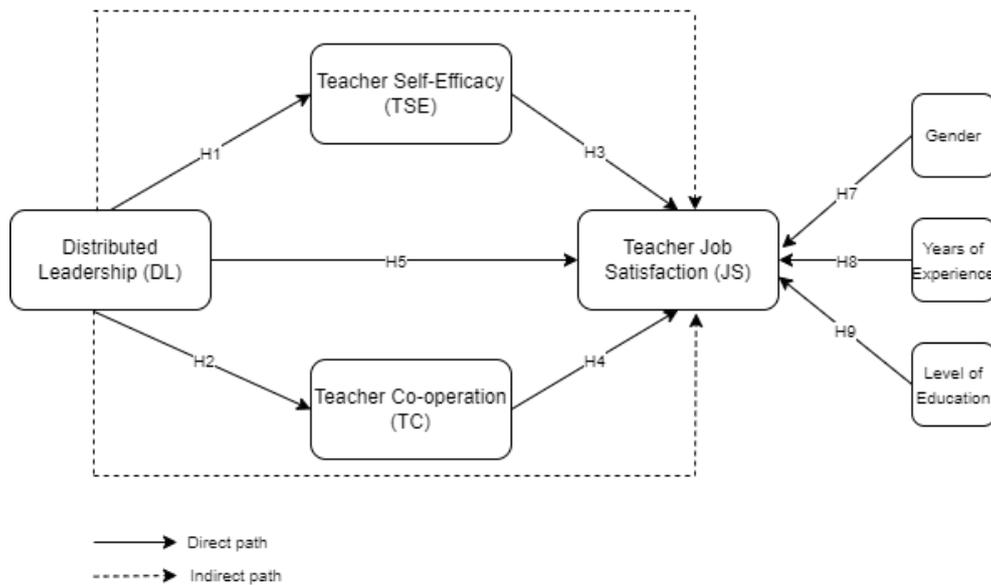
Figure 1. Conceptual model of the study.

Method

In the current study, we investigated the relationship among job satisfaction, self-efficacy and co-operation of the teachers who participated in Teaching and Learning International Survey - TALIS 2018 as well as school principals' teacher-perceived distributed leadership behaviours. As this study focuses on the mediating effect of distributed leadership behaviours of school principals on teachers' job satisfaction, we employed a correlational design (Fraenkel & Wallen, 2006).

Data Source and Participants

In the current study, we used the data gathered through a survey conducted within the framework of TALIS 2018 by the Organization for Economic Cooperation and Development (OECD) in 48 participating countries and economies. TALIS 2018 has a multi-level structure that consists of data about both teachers and school principals. TALIS gathers data from teachers working at primary, secondary and high schools as well as their school principals. In this context, we used a two-staged sampling method to identify the schools to be included in the study (OECD, 2019). In the current study, we used the data set coded as TTGINTT3 including the data from teachers which are all shared public by OECD on its website. We limited the data set to include participants only from Turkey by choosing 792 code, which is the code of Turkey in the category of countries coded IDCNTRY in the file. In this scope, we conducted the analysis with a data set gathered from 19,089 teachers. 47.4% of the participants were male, while 52.6% of them were female. Also, the year of experience was 14.85 years on average (*SD*= 8.91). Only 2.3% of the participants had an associate degree, while 15% of them had a graduate degree.

Variables and Data Collection Tools

Job Satisfaction. This scale (T3JOBSA) consists of eight items (APPENDIX-A) under two dimensions. The first dimension includes four items that measure teachers' job satisfaction with work environment (T3JSENV). An example item of this dimension is, "I enjoy working at this school (TT3G53E)." The second dimension has four items that measure teachers' satisfaction with their profession (T3JSPRO). An example item says "I regret that I decided to become a teacher (TT3G53D)." The scale is a 4-point Likert-type scale with responses varying from "*1 = I strongly disagree*" and "*4 = I strongly agree.*" Within the framework of the current study, we used teachers' index score as to job satisfaction (T3JOBSA). We calculated the McDonald omega reliability coefficient of the scale to be .89. The results of the conducted measurement invariance showed that T3JOBSA was at the level of scalar

invariance. We found that standardized factor loadings of the items included in the scale varied between .560 (TT3G53J) and .908 (TT3G53B) (OECD, 2019). We also conducted confirmatory factor analysis to have an evidence for the construct validity of the scale. The results of the analysis showed good model fit values [$p < .001$, RMSEA = 0.08, SRMR = 0.04, CFI = 0.96, TLI = 0.95].

Teacher Self-efficacy. This scale (T3SELF) consists of 12 items (APPENDIX-A) under three dimensions, which are self-efficacy in class management (T3SECLS), self-efficacy in instruction (T3SEINS) and self-efficacy about student engagement (T3SEENG). Example items for each dimension respectively include "Get students to follow classroom rules (TT2G34H)", "Use a variety of assessment strategies (TT2G34J)" and "Help students think critically (TT2G34G)". Responses to each item varies between "*1 = not at all*" and "*4 = a lot*". Within the framework of the current study, we used teachers' index score as to self-efficacy (T3SELF). The results of the conducted measurement invariance showed that T3SELF had scalar invariance. We calculated the McDonald omega reliability coefficient of the whole scale to be .93. We found that standardized factor loadings of the items included in the scale varied between .619 (TT2G34C) and .847 (TT2G34H) (OECD, 2019). We also conducted confirmatory factor analysis to have an evidence for the construct validity of the scale. The results of the analysis showed good model fit values [$p < .001$, RMSEA = 0.06, SRMR = 0.01, CFI = 0.98, TLI = 0.98].

Teacher Co-operation. This scale (T3COOP) consists of two dimensions, which are exchange and co-ordination among teachers (T3EXCH) and professional collaboration in lessons among teachers (T3COLES). Each dimension has four items (APPENDIX-A). An example of the items included in the dimension of T3EXCH is, "Exchange or develop teaching materials with colleagues (TT3G33D)", while an example of the items included in the dimension of T3COLES is, "Provide feedback to other teachers about their practice (TT3G33B)". The scale is a 6-point Likert-type scale. Within the framework of the current study, we used teachers' co-operation index score (T3COOP) as a mediating variable. We calculated the McDonald omega reliability coefficient of the whole scale to be .87. The results of the conducted measurement invariance showed that T3COOP had a metric invariance. The standardized factor loadings of the items (OECD, 2019) ranged from .548 (TT3G33H) and .882 (TT3G33F). We also conducted confirmatory factor analysis to have an evidence for the construct validity of the scale. The results of the analysis showed very good model fit values [$p < .001$, RMSEA = 0.04, SRMR = 0.02, CFI = 0.99, TLI = 0.98].

Distributed Leadership. We used the data consisting of responses to the items included in the dimension of participation of shareholders coded T3STAKE, a dimension of School Climate Scale in the teacher questionnaire in order to evaluate the distributed leadership behaviours of school principals as perceived by teachers (APPENDIX-A). There are five items in the scale. The scale is a 4-point Likert-type scale with responses varying between "*1 = I strongly disagree*" and "*4 = I strongly agree.*" An example item in this dimension is, "This school provides students with opportunities to actively participate in school decisions". We calculated the McDonald omega reliability coefficient of T3STAKE to be .90. The results of the conducted measurement invariance showed that T3STAKE had a metric invariance. We found out that standardized factor loads of the items included in the scale varied between .791 (TT3G48C) and .910 (TT3G48A) (OECD, 2019). We also conducted confirmatory factor analysis to have an evidence for the construct validity of the scale. The results of the analysis showed very good model fit values [$p < .001$, RMSEA = 0.02, SRMR = 0.02, CFI = 0.99, TLI = 0.98].

Control Variables. We included participant teachers' gender (TT3G01), years of experience in teaching (TT3G11B) and level of education (TT3G03) in the model in order to control their effects on job satisfaction, which is the dependent variable of the current study (Greenland, 2011). Previous studies show that men and women experience job satisfaction at different levels (Büyükgöze & Özdemir, 2017; Filiz, 2014; Sarpkaya, 2000). There are some other studies which show that there is a negative relation between teachers' organizational commitment and job satisfaction as their level of education increases (e.g. Bogler & Nir, 2015). Bogler and Berkovich (2020) indicate that as teachers' level of education increases along with quality, their expectations might increase, and the extent to which these expectations are met in the work environment might not satisfy teachers. We also controlled teachers' years of experience in teaching. Some study findings show that there are significant relationships between teachers' years of experience and job satisfaction (e.g. Eker, 2006; Gençer, 2004). That's why, we controlled the participant teachers' year of experience considering its potential effect on job satisfaction, which is the dependent variable of the current study. We added gender by coding it as *female* = 1, *male* = 0, while we added years of experience metrically. As there are three sub-categories as to the level of education as (1) associate degree, (2) bachelor's degree and (3) postgraduate degree, we created two dummy variables and added them to the model.

Procedures and Data Analysis

In the current study, we used single level data as to four variables regarding teachers and some other contextual variables. We decided to address the data as single level because the current study focuses on its overall level of teacher self-efficacy and co-operation in the relation between school principals' leadership behaviours and teachers' job satisfaction as well as the relations among the variables in Turkish context. The purpose of the current study is to reveal differences between schools. We analysed the study data via maximum estimation method. We also developed partial mediating SEM model to investigate the effect of school principals' distributed leadership perceived by teachers on their job satisfaction.

For the preliminary analysis, we examined the missing data in the data set first. Because the rate of missing data was 1.1% (T3COOP) minimum and 1.5% (T3SELF) maximum, we employed maximum likelihood estimation. We transformed scores into standardized z-scores in order to identify possible univariate outliers in the data set. In this context, we removed two responses from z-T3JOBSA data set, and 20 responses from z-T3SELF data set. We also examined the skewness and kurtosis values for each variable to test univariate normality assumption. Skewness values of the variables varied between -.519 (T3STAKE) and .520 (T3COOP), while kurtosis scores varied between -.644 (T3SELF) and .541 (T3STAKE) (Chou & Bentler, 1995). We removed 81 responses from the data set after identifying multivariate outliers, which refer to unusual scores resulting from the combination of four variables examined within the framework of the current study (Mertler & Vannatta, 2002).

We examined the bivariate correlation coefficients between the independent variables of the study in order to see if the data set had the problem of multicollinearity (Field, 2009), and we concluded that the data set did not have the problem of multicollinearity as the correlation levels were lower than 0.80 (*Table 1*). We also examined tolerance values and variance inflation factor (VIF). Tolerance value is the correlation coefficient between the independent variables of the model, and a tolerance value lower than .20 refers to a problem (Şencan, 2005). We concluded in the current study that tolerance values varied between .865 and .911. On the other hand, variance inflation factor refers to the amount of variance that is not shared by two independent variables in the analysis. We concluded in the current study that variance inflation factor varied between 1.098 and 1.157. While Şencan (2005) indicates that a VIF value higher than 4.00 refers to the problem of multicollinearity, while DeMaris (2004) states that a VIF value higher than 10.00 might indicate the problem of collinearity in the data set. Furthermore, studies that use single level data set might have the problem of common method bias depending on the social desirability. As suggested by Podsakoff, MacKenzie, Lee, and Podsakoff (2003), we conducted Harman's single factor test in order to see if the data set had common method bias. In this context, we calculated the variance explained by the scale items gathered under one factor to be 25.12%. A value higher than 50% refers to the problem of common method bias in the study data (Cooper et al., 2020).

Results

Table 1 below shows the means, standard deviation values and bivariate correlations as to the four variables of the current study.

Table 1. Mean values, standard deviations and correlation coefficients

Variables	M	SD	DL	TSE	TC	JS
1. Distributed leadership	11.02	2.61				
2. Teacher self-efficacy	12.63	2.29	.220**			
3. Teacher co-operation	9.86	2.51	.259**	.311**		
4. Job satisfaction	12.09	2.28	.453**	.253**	.231**	

**p < .001. *M:* Mean, *SD:* Standard Deviation, DL: Distributed Leadership, TSE: Teacher Self-efficacy, TC: Teacher Co-operation, JS: Job Satisfaction

As is seen in Table 1, the mean values of the variables ranged between 9.86 and 12.63. According to this, the participant teachers' views as to co-operation had the lowest mean value. The variable that had the highest level of participation was teacher self-efficacy. In this context, it seems possible to state that teacher co-operation at schools was relatively low. On the other hand, it is clear that the participant teachers were feeling quite competent in terms of class management and educational activities. On the other hand, it is obvious that standard deviation values as to the variables varied between 2.29 (T3SELF) and 2.61 (T3STAKE). According to this, it is possible to indicate that standard deviation values were relatively at a medium level, and the participant teachers had a similar level of participation. However, the highest level of standard deviation belonged to the variable of distributed leadership behaviours by school principals, and the participant teachers had different views as to the school principals' distributed leadership behaviours the most.

We conducted a path analysis with mediating variables to test the direct and indirect paths suggested in the theoretical framework of the current study. We examined the suggested theoretical model via goodness of fit indices. Accordingly, we examined root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), comparative fit index (CFI) and Tucker-Lewis fit index (TLI). A RMSEA and SRMR value lower than 0.80, and a CFI and TLI value higher than 0.90 refer to an acceptable level of fit (Marsh, Hau, & Wen, 2004). Model fit indices of the current study [$p < .001$, RMSEA = 0.03, 90% CI 0.02 – 0.03, SRMR = 0.02, CFI = 0.98, TLI = 0.96] showed that there was a high goodness of fit between the theoretical framework and data set. After examining the goodness of fit indices, we examined the relationships between the direct and indirect paths and reported the results with standardized regression coefficients (Table 2).

Table 2. Standardized direct, indirect and total effects, TALIS 2018

	β	**SE**	**p**
Standardized direct effects			
DL → JS	.400	.006	.000
DL → TSE	.217	.007	.000
DL → TC	.260	.007	.000
TSE → JS	.132	.010	.000
TC → JS	.083	.013	.000
Standardized total indirect effects			
DL → TSE → JS	.029	.002	.000
DL → TC → JS	.022	.002	.000
Standardized total effects			
DL → JS	.450	.006	.000

DL: Distributed Leadership, TSE: Teacher Self-efficacy, TC: Teacher Co-operation, JS: Job Satisfaction, SE: Standard Error, *β* = standardized regression coefficient.
This model was controlled by teacher gender, years of experience and level of education [$p < .001$].

As is seen in Table 2, there was a statistically significant and moderate relationship between school principals' teacher-perceived distributed leadership behaviours and teachers' job satisfaction (*β* = .400, *SE* = 0.007, *p* < .001). This finding indicates that school principals' distributed leadership behaviours and practices affect teachers' job satisfaction. In other words, teachers' active participation in decision-making processes as well as the collaborative culture at school contribute to teachers' job satisfaction. The results of the study also revealed that distributed leadership was a significant predictor of teachers' self-efficacy (*β* = .217, *SE* = 0.007, *p* < .001). Accordingly, it seems possible to state that sharing responsibilities about school positively affects teachers' self-efficacy perceptions. Likewise, the results of the path analysis demonstrated that school principals' distributed leadership behaviours influenced teacher co-operation positively (*β* = .260, *SE* = 0.007, *p* < .001). It is possible to state that when teachers participate in school decision-making more often, their sense of responsibility for school grows, which increases co-operation among teachers to contribute to school improvement and problem solving.

The analysis conducted within the current study concluded that teacher self-efficacy, one of the mediating variables in the model, had a statistically significant positive effect on teachers' job satisfaction (*β* = .132, *SE* = 0.007, *p* < .001). This finding indicates that teachers' job satisfaction increases when they have a higher level of self-efficacy as to class management, choice of teaching methods and practices as well as students' interest in class. The study analysis also revealed that teacher co-operation, the other mediating variable in the current study, was positively related to job satisfaction, the dependent variable of the study, at a statistically significant but at a lower level (*β* = .083, *SE* = 0.007, *p* < .001). Accordingly, it appears that exchange among teachers or collaboration for development positively reflects on their professional lives.

When we examined the indirect effects, we found that teachers' self-efficacy had a statistically significant but low level effect on the relationship between school principals' distributed leadership behaviours and practices, and teachers' job satisfaction (*β* = .029, *SE* = 0.002, *p* < .001). In this context, it is possible to show that teachers' self-efficacy about their relationships with students and class management improves when school principals encourage them to participate in school processes, having a positive impact on teachers' job satisfaction. Similarly, teachers who had a more active role in school-related issues collaborate more, and that enhanced their job satisfaction (*β* = .022, *SE* = 0.002, *p* < .001). According to these findings, teacher self-efficacy and teacher co-operation, which are two variables included in the study model, explained almost 5.1% of the total variance in teacher job satisfaction (Figure 2).
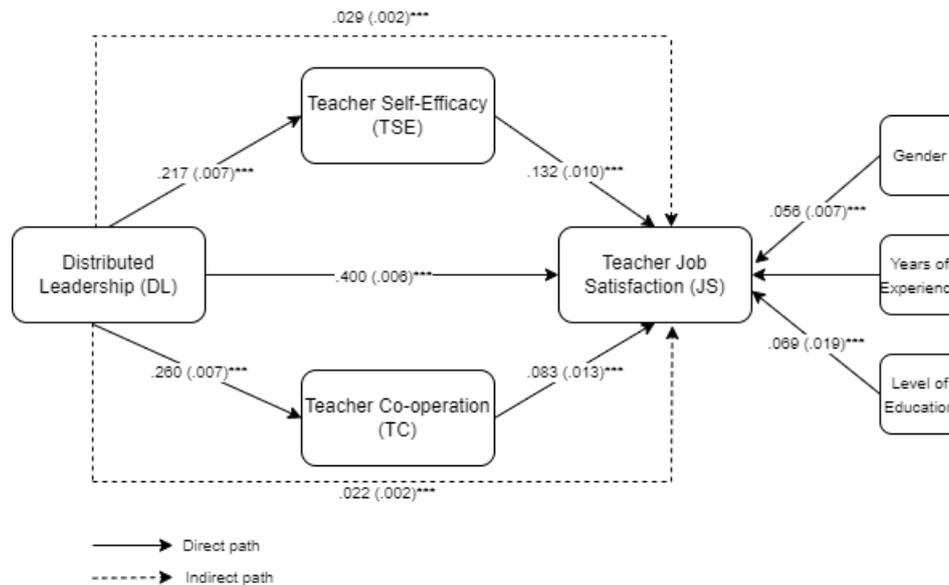
Figure 2. Direct and indirect effects among the variables.

We included some contextual variables in the model as controlling variables. When we looked at gender, we explored that female teachers were more satisfied with their jobs than male teachers (β = .056, SE = 0.007, $p < .001$). In addition, we concluded that more years of experience increases teacher job satisfaction (β = .069, SE = 0.007, $p < .001$).

When we looked at the results by level of education, there was no statistically significant difference between associate degree graduates and bachelor degree graduates in terms of teacher job satisfaction (β = .009, SE = 0.007, $p > .001$). In other words, teachers with an associate or bachelor's degree reported similar levels of job satisfaction. Teachers with a graduate degree, on the other hand, were less satisfied with their jobs than their colleagues with an associate or bachelor's degree (β = -.017, SE = 0.007, $p < .001$). Because we looked at three different groups based on education level (associate degree, bachelor's degree, and post-graduate degree), Figure 2 does not include coefficients for education level.

Finally, when we investigated the total effect of school principals' distributed leadership behaviours and practices on teachers' job satisfaction, and we explored a statistically significant and positive relationship at a moderate level (β = .450, SE = 0.006, $p < .001$). The mediation model developed in this study explained 45% of the variance in teachers' job satisfaction. In this sense, the current study supports previous studies that found that school principals' leadership behaviours affected teachers' emotional experiences as to their job.

Discussion, Conclusion and Suggestions

The current study aims at investigating the effects of distributed leadership on teacher outcomes. We tested the model developed with four main variables and three control variables, and focused on the relationship between distributed leadership as perceived by teachers, and teacher self-efficacy and co-operation as well as the direct or indirect predictor effects of job satisfaction. The participants were composed of 19089 teachers from Turkey. We addressed the study data as one-level data, and developed a structural equation model with four main variables and three control variables. We tested nine hypotheses in the current study. After testing the first hypothesis, we found out that school principals' distributed leadership among teachers had a statistically significant positive effect on teachers' self-efficacy (Hypothesis 1). This finding supports the previous study findings in the literature (Dou, Devos, & Valcke, 2017; Leithwood & Beatty, 2008; Mascall et al., 2008; Olsen, 2008; Zheng, Li, Chen, & Loeb, 2017; Zheng, Yin, & Li, 2018). Likewise, Liu et al. (2021) conducted a study in which they concluded that distributed leadership improved teachers' belief in teaching. Relying on the previous study findings as well as the results of the test for Hypothesis 1 in the current study, it appears possible

to indicate that school principals' distributed leadership among teachers will create a learning environment composed of teachers who believe in themselves, thereby increasing the educational effectiveness. As a result of the statistical analysis conducted to test the Hypothesis 2, we found that teachers' perceptions of distributed leadership were positively related to teacher co-operation at a statistically significant level (Hypothesis 2). This finding supports many other findings in the literature (Halverson et al., 2014; Harris & Jones, 2010; Khourey-Bowers, Dinko, & Hart, 2005; Liu & Printy, 2017; Silins et al., 2002; Zheng et al., 2019). These studies show that distributed leadership encourages teacher co-operation, creating a school environment where teachers share information with each other, support each other, and take joint responsibility in order to develop teaching and learning capacity. Furthermore, it is known that teacher co-operation reinforces their self-efficacy, and their self-efficacy increases their job satisfaction (Caprara, Barbaranelli, Steca, & Malone, 2006; Hallinger & Heck, 2009; Klassen & Chiu, 2010; Mascall et al., 2008; Van Maele & Van Houtte, 2012; Zee & Koomen, 2016; Zheng et al., 2019). Hence, school principals' distributed leadership behaviours can form a school environment which encourages teacher co-operation and increases their tendency to take joint responsibility. Each and every innovative and reformist practice in such an environment can come true with co-operation.

The analysis to test Hypothesis 3 and 4 showed that school principals' distributed leadership was positively related to teacher self-efficacy, teacher co-operation and job satisfaction at a statistically significant level (Hypotheses 3 and 4). We also found that teacher self-efficacy and co-operation had a low-level mediating effect on the relationship between distributed leadership and job satisfaction, while distributed leadership was a strong predictor of teacher job satisfaction. The current study finding shows that school principals' distributed leadership satisfies teachers both cognitively and emotionally. This finding is line with the previous study findings in the literature (Heck & Hallinger, 2009; Thien, 2019; Zee & Koomen, 2016; Zheng et al., 2019), and it is clear that considering this finding at schools administered with a centralist approach will strengthen the schools' organizational capacity (Liu & Printy, 2017), reinforce teachers' professional development (Irvine, 2021; Thien & Chan, 2022), and positively affect organizational change and development (Harris, 2004, 2008; Leithwood et al., 2009). As these studies imply, distributed leadership contributes to educational capacity in such a positive way and strengthens the learning environment, which draws attention to the fact that this style of leadership should be given more focus in bringing up school leaders. However, it is also known that when school principals distribute leadership, this increases teachers' workload and causes stress (Liontos & Lashway, 1997), school principals feel that their authority weakens as they distribute leadership (Ho & Ng, 2017), various examples of misconduct can arise as school principals distribute their authority (Lumby, 2013). Because of that, school principals might need to avoid ignoring school dynamics and monitor the process actively while distributing the leadership.

After we tested the Hypothesis 5 and 6, we concluded that distributed leadership as perceived by teachers affected job satisfaction at a moderate level (Hypotheses 5, 6). In Turkey, there is a traditional system in which teachers are used to fulfilling the instructions given by school principals downward, and it is remarkable that distributing leadership in this system can significantly affect teachers' job satisfaction in a positive way. Liu et al.' (2021) study with participants from 32 countries, 6045 schools and 104.358 teachers indicated that distributed leadership had a positive effect on teacher job satisfaction at a statistically significant level. Likewise, Hung (2005) also reported that teachers' job satisfaction increased when they were empowered by school principals. Sun and Xia (2018) also concluded that teachers who perceived a high level of distributed leadership tended to report a high level of self-efficacy and job satisfaction. On the other hand, Hulpia et al. (2009) stated that teachers' participating in decision-making process is not related to their job satisfaction, and there is a weak relationship between school principals' distributed leadership practices and job satisfaction. There are even some studies (Ho & Ng, 2017) that put forth that school principals' perceive it as a threat to their ego and authority to have teachers participate in decision-making. Liontos and Lashway (1997) also asserted that distributed leadership may increase teachers' workload, which might also increase their work-related stress. Although the study findings in the literature contradict each other, there is a higher number of studies that reveal that sharing leadership, empowering teachers and having them

participate in decision-making have a positive and significant effect on teachers' job satisfaction (Liu & Printy, 2017; Liu & Werblow, 2019; Pearson & Moomaw, 2005; Sun & Xia, 2018; Thien, 2019; Zembylas & Papanastasiou, 2005), and our study finding supports these findings. Although there are some contradictory study findings, the high number of studies that support the results of the current hypothesis implies that these relations can be weak at schools having different learning environments due to unmeasurable different dynamics. Because of that reason, this study can be addressed through different methods in schools' own dynamics. Hence, it is possible to meet various implied factors about the power and unifying effect of distributed leadership.

The seventh hypothesis of the current study assumed that gender would affect teachers' job satisfaction. When we tested the hypothesis, we found out that female teachers had a higher level of job satisfaction than male teachers (Hypothesis 7). Literature reports similar findings (Crossman & Harris, 2006; DeNobile & McCormick, 2008; Ladebo, 2005; Spear, Gould, & Lee, 2000). The studies in the literature state that this might be because female teachers are less career-focused than their male colleagues (Kremer-Hayton & Goldstein, 1990), and so they have fewer expectations, which means that they have a higher level of job satisfaction (Witt & Nye, 1992). In the light of the current finding related to this hypothesis and the related studies in the literature, it turns out to be important to measure and evaluate male teachers' career expectations, and identify the issues that will improve their job satisfaction. After testing the eighth hypothesis of the current study, we concluded that teachers' job satisfaction increased as their year of experience increased (Hypothesis 8). The literature shows that novice teachers have a higher risk of burnout, which in turn negatively affects their job satisfaction (DeNobile & McCormick, 2008; Griva & Joekes, 2003). Because of that reason, some new units can be developed in the Ministry of National Education to give emotional and professional support to novice teachers. According to another perspective, teachers participate in decision-making more as their experience in teaching gets more, which positively affects their job satisfaction (Menon & Athanasoula-Reppa, 2011). The ninth hypothesis of the current study assumed that teachers' level of education would affect their job satisfaction. After testing the ninth hypothesis, we found out that teachers' level of job satisfaction did not differ for those having an associate or bachelor's degree, whereas teachers who had a graduate degree had a lower level of job satisfaction than the others (Hypothesis 9). There are many studies reporting similar findings (Menon, Papanastasiou, & Zembylas, 2008; Mondal, Shrestha, & Bhaila, 2011; Sharma & Jyoti, 2006; Travers & Cooper, 2018). In this line, Mondal et al. (2011) stated that teachers having a higher level of education had innovative attempts on which they could reflect their education, but these attempts were questioned and even not supported by school principals most of the time. In line with the result of this hypothesis and other studies in the literature, it is thought that teachers having a graduate degree can have a higher level of job satisfaction if they are given opportunities to participate in making policy or developing educational programs or projects, which will make them put cognitive effort and have a high level of individual satisfaction. Furthermore, it is common sense to leverage teachers' professional experience in order to make better use of human resources.

Relying on the previous literature and the current study findings, and considering the effect of school principals on job satisfaction of teachers who are in the center of education, this issue deserves more attention. It is necessary to consider the findings and limitations of the current study, and conduct more comprehensive studies which will get deeper into the issue employing a qualitative and mixed research design on how school principals' distributed leadership behaviours reflect on school environment, and how school culture and teachers are affected by this. It is also thought that employing distributed leadership functionally for interaction with teachers will flex the strict hierarchical downward approach to administration. It is envisaged that organizations will be able to include teachers in the administrative process according to their own dynamics, and teachers will more readily adopt the ideas they have participated in, which will ensure that attempts for change and development will not be abandoned. In this scope, further studies can identify how distributed leadership practices affect the change at school, and to what extent they can contribute to school improvement. Moreover, school principal training programs can be enriched to include the characteristics of the distributed leadership and explain its effect on school learning environment.

Limitations

The current study findings should be evaluated considering some limitations. The current study data is composed of TALIS 2018 conducted by OECD. In other words, the current study findings rely on cross-sectional data, and they do not allow to make cause-and-effect inferences. Future studies can make use of data from the previous and/or future implementations of TALIS to conduct longitudinal studies, which will make it possible to make inferences based on cause-and-effect about the relationship between school principals' leadership behaviours, and teachers' behaviours and attitudes. The model in the current study explained 45% of the variance in job satisfaction, which was the outcome variable of the study. This result implies that it is necessary to identify most of the factors that affect teachers' job satisfaction. However, the current study was based on single level analysis to identify the general situation in Turkey. In fact, school leadership is a multi-level variable that depends on many contextual variables. Because of this reason, future studies can be conducted relying on multi-level analysis in order to identify the school-level interactions and differences. Lastly, the current study relied on only teachers' perspective in order to explain teachers' job satisfaction. In this context, future studies can focus on teachers' job satisfaction by including school principals' perspective and school-level contextual variables, as well.

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Appendix 1

Items and scales used in the current study - TALIS 2018 dataset

Job Satisfaction - T3JOBSA
T3JSENV: Job satisfaction with work environment
TT3G53: We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Response options: "Strongly disagree" (1), "Disagree" (2), "Agree" (3), "Strongly agree" (4).
TT3G53C*: I would like to change to another school if that were possible
TT3G53E: I enjoy working at this school
TT3G53G: I would recommend this school as a good place to work
TT3G53J: All in all, I am satisfied with my job

T3JSPRO: Job satisfaction with profession
TT3G53: We would like to know how you generally feel about your job. How strongly do you agree or disagree with the following statements?

Response options: "Strongly disagree" (1), "Disagree" (2), "Agree" (3), "Strongly agree" (4).
TT3G53A: The advantages of being a teacher clearly outweigh the disadvantages
TT3G53B: If I could decide again, I would still choose to work as a teacher.
TT3G53D*: I regret that I decided to become a teacher
TT3G53F*: I wonder whether it would have been better to choose another profession

Teacher Self-Efficacy - T3SELF
T3SECLS: Self-efficacy in classroom management
TT3G34: In your teaching, to what extent can you do the following?

Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).
TT2G34D: Control disruptive behaviour in the classroom
TT2G34F: Make my expectations about student behaviour clear
TT2G34H: Get students to follow classroom rules
TT2G34I: Calm a student who is disruptive or noisy

T3SEINS: Self-efficacy in instruction
TT3G34: In your teaching, to what extent can you do the following?

Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).
TT2G34C: Craft good questions for students
TT2G34J: Use a variety of assessment strategies
TT2G34K: Provide an alternative explanation, for example when students are confused
TT2G34L: Vary instructional strategies in my classroom

T3SEENG: Self-efficacy in student engagement
TT3G34: In your teaching, to what extent can you do the following?

Response options: "Not at all" (1), "To some extent" (2), "Quite a bit" (3), "A lot" (4).
TT2G34A: Get students to believe they can do well in school work
TT2G34B: Help students value learning
TT2G34E: Motivate students who show low interest in school work
TT2G34G: Help students think critically

Teacher Co-operation - T3COOP
T3EXCH: Exchange and co-ordination among teachers
TT3G33: On average, how often do you do the following in this school?

Response options: "Never" (1), "Once a year or less" (2), "2-4 times a year" (3), "5-10 times a year" (4), "1-3 times a month" (5), "Once a week or more" (6)
TT3G33D: Exchange or develop teaching materials with colleagues
TT3G33E: Discuss the learning development of specific students
TT3G33F: Work with other teachers in this school to ensure common standards in evaluations for assessing student progress
TT3G33G: Attend team conferences

T3COLES: Professional collaboration in lessons among teachers
TT3G33: On average, how often do you do the following in this school?

Response options: "Never" (1), "Once a year or less" (2), "2-4 times a year" (3), "5-10 times a year" (4), "1-3 times a month" (5), "Once a week or more" (6)
TT3G33A: Teach jointly as a team in the same class
TT3G33B: Provide feedback to other teachers about their practice
TT3G33C: Engage in joint activities across different classes and age groups (e.g. projects)
TT3G33H: Participate in collaborative professional learning

Teacher Perceived Distributed Leadership - T3STAKE
TT3G48: How strongly do you agree or disagree with these statements, as applied to this school?

Response options: "Strongly disagree" (1), "Disagree" (2), "Agree" (3), "Strongly agree" (4).
TT3G48A: This school provides staff with opportunities to actively participate in school decisions.
TT3G48B: This school provides parents or guardians with opportunities to actively participate in school decisions.
TT3G48C: This school provides students with opportunities to actively participate in school decisions.
TT3G48D: This school has a culture of shared responsibility for school issues.
TT3G48E: There is a collaborative school culture which is characterised by mutual support.

*Reverse coded item.