

Examining the Relationship Between Teachers' Professional Development and Self-Efficacy: TALIS 2018 Turkey Case

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ABSTRACT

In this study, the teacher questionnaire included in the TALIS 2018 Turkey application was used. It was aimed to investigate the relationships between the sub-dimensions of teacher professional development and teacher self-efficacy scales in the questionnaire. The sub-dimensions of the teacher self-efficacy scale were grouped into three dimensions: self-efficacy in classroom management, self-efficacy in teaching, and self-efficacy for student engagement. The teacher professional development scale has four dimensions: effective professional development, professional development needs in subject matter and pedagogy, professional development needs for teaching for diversity, and professional development barriers. The data obtained from 10198 participants were tested using the relational research model. Canonical correlation analysis was applied to the data obtained from the research. According to the findings, there is a significant ($p < .05$) and positive relationship between teachers' professional development and self-efficacy. In addition, according to the explained variance values, the first set shares 3% of the variance and the second set shares 1% of the variance. The recommendations made based on the results are to encourage teachers' communication and collaboration with each other and to increase teachers' professional development by supporting teachers to learn more. Policy practitioners can give teachers a say in matters such as choosing textbooks and teaching formats. They can support student and teacher psychology and create a system of professional counseling to solve problems. In future research, different variables in the TALIS survey can be used with different analysis methods.

Keywords: Teachers, Teachers' self-efficacy, Teachers' Professional development.

INTRODUCTION

The teaching profession is a professional occupation that requires academic study and professional formation together with specialized knowledge and skills in social, cultural, economic, scientific and technological fields related to the education sector. Teachers have to fulfill these duties in accordance with the general aims and principles of National Education (Dağlıoğlu, 2020, p.73). The teaching profession has been recognized as a model for other professional sectors, aiming for universal and lasting learning opportunities for individuals in societies. High quality feeders are necessary to ensure effective effects via national school systems. As a result for sustained globalization to be of "high quality," orderly options are needed to distribute diversity competencies (Barrera-Pedemonte, 2016). The professional development and self-efficacy of these teachers is also important for achieving high quality education in schools.

Teacher self-efficacy and professional development are two important concepts that are often associated with teacher performance and student learning. In light of school reforms focused on improving teacher quality as a result of effective schools, it is becoming clear that there is a need for professional development programs or activities designed to improve teacher quality (Gümüş & Bellibaş, 2021). Professional development has long been seen as a mechanism for developing and sustaining teachers' professional knowledge, and it is recognized that pre-service and master's degrees have a limited lifespan. However, approaches to teacher professional development often fall short of providing teachers with the learning they need to improve their practice and student learning at different points in their professional careers (Fairman et al., 2020). Professional development can provide a variety of learning activities to support teachers to apply what they have learned to their own practice and solve problems in their own classrooms. Thus, through professional development, teachers are provided with a space to relate their knowledge about a particular program and its goals to the practice they experience in the classroom (Farrov, Kavanagh, & Samudra, 2022).

Teachers' self-efficacy

Teacher self-efficacy is related to teachers' beliefs about the extent to which they can influence student learning in general (Cantrell & Hughes, 2008). Goddard et al. (2004) found that there is a positive correlation between teaching effectiveness and self-efficacy when teachers are confident about their profession and change their behaviors in ways that contribute to student learning. Moreover, according to Stein and Wang (1988), strong

teacher efficacy is often associated with effective classroom behaviors and positive student outcomes. On the other hand, teachers with low levels of self-efficacy will be less motivated to exert effort during teaching and will show lower levels of persistence. The concept of teacher self-efficacy is not an all or nothing concept. Therefore, teachers may have different levels of self-efficacy (Powell-Moman & Brown-Schild, 2011, p.48). The use of teacher self-efficacy as a concept through which teacher in-service training can be designed and evaluated offers a viable and promising means to move towards this goal (Clark & Bates, 2003). Therefore, it can be said that these in-service trainings will significantly increase the professional development of teachers.

Teachers' professional development

In many studies in the literature, teachers' professional development has been associated with teacher quality, student learning, teaching quality and student outcomes (Masters, 2003; Meiers & Ingvarson, 2005; Yates, 2007). Teachers' professional practices are strong sources of efficacy knowledge that increase beliefs that influence how they conceive of themselves in creating favorable environments for their students. (Tran, 2014, p.90 Curriculum-oriented professional development and collaboration in particular represent characteristics that are more directly associated with diversity in teachers' practice (Barrera-Pedemonte, 2016). On the other hand, in order to increase teachers' professional development, it is necessary to increase their self-efficacy (Kaya, 2021). Developing research on the effects of professional development activities on teachers' self-efficacy with such comprehensive data can help to understand the diversity in professional development opportunities for teachers in different countries around the world (Gümüő & Bellibaő, 2021). This study aims to examine the relationship between teachers' professional development and self-efficacy. Investigating this relationship is important because it also affects student achievement in schools. Therefore, it is thought to contribute to the related literature.

THE STUDY

In this research, the research model, participants, data collection tools and data analysis are presented in this section.

Research model

In this study, the relational research model was used since it was aimed to examine the relationship between teachers' professional development and self-efficacy. The relational research model enables the investigation of the relationships between two or more variables (Fraenkel & Wallen, 2006).

Participants

In this study, the data set shared on the OECD website and including teacher-level data was used. This data set was limited to include only participants from Turkey. The participants identified within the scope of the study consisted of teachers who participated in the TALIS 2018 Turkey survey. After deleting the missing data, the data obtained from the remaining 10198 respondents were used. Of these, 52.3% were female and 47.7% were male.

The schools identified in TALIS 2018 were determined by the OECD using a two-stage sampling method. It is a two-stage sampling as first a sample of schools is selected and then a representative sample of teachers is sampled from each selected school. The design weighting for teacher data therefore has two components, one allowing for expansion from the single teacher to the school and the other allowing for integration from the school to the country (OECD, 2019).

Data collection tools

In this study, the teacher professional development scale and the teacher self-efficacy scale in the TALIS 2018 survey were used for the purpose of the research.

Teacher Self-Efficacy: In the TALIS 2018 questionnaire, the teacher self-efficacy scale has 12 items collected in three dimensions: teachers' self-efficacy in classroom management (T3SECLS), self-efficacy in teaching (T3SEINS), and self-efficacy for student engagement (T3SEENG). The items are rated from "1 = never" to "4 = very often" (OECD, 2019).

Teacher Professional Development: In the TALIS 2018 survey, there are 19 items in four dimensions of the teachers' professional development scale: effective professional development (T3EFFPD), professional development needs in subject matter and pedagogy (T3DPED), professional development needs for teaching for diversity (T3PDIV), and barriers to professional development (T3PDBAR). The "Effective professional development" dimension is "Yes" (1) and "No" (2), the "Needs for professional development in subject matter and pedagogy" and "Needs for professional development for teaching for diversity" dimensions are "No need at

present" (1), "Low level of need (2)", "Moderate level of need" (3), "High level of need" (4) and finally "Professional development barriers" dimension is answered as "Strongly disagree" (1), "Disagree" (2), "Agree" (3), "Strongly agree" (4) (OECD, 2019).

Data analysis

In order to explain the relationship between teachers' professional development and self-efficacy determined in line with the purpose of the study, canonical correlation analysis was used with the statistical package program for social sciences (SPSS). According to Tabachnick and Fidell (2007), canonical correlation analysis is used to examine the relationship between two sets of variables. In canonical correlation analysis, there are multiple predictor variables and outcome variables (Kline, 2011). In canonical correlation, the relationship is examined by finding a linear combination of Y variables and a linear combination of X variables such that the scores obtained from the Y combination are maximally correlated with the scores obtained from the X combination (Marcoulides & Hershberger, 1997).

The assumptions of canonical correlation analysis are normal distribution, multicollinearity and linearity (Kalaycı, 2014). Correlation values were calculated for the presence of multicollinearity among the variables (Büyüköztürk, 2009) and it was observed that there was no multicollinearity among the variables. In addition, skewness and kurtosis values were examined for the normality of the data set and it was concluded that it showed a normal distribution (Büyüköztürk, 2009) since it was in the range of (-1, +1).

The variable sets used in the research are teacher self-efficacy and teacher professional development. Teacher self-efficacy scale has 3 sub-dimensions and teacher professional development scale has 4 sub-dimensions. The model established for canonical correlation analysis is given in Figure 1.

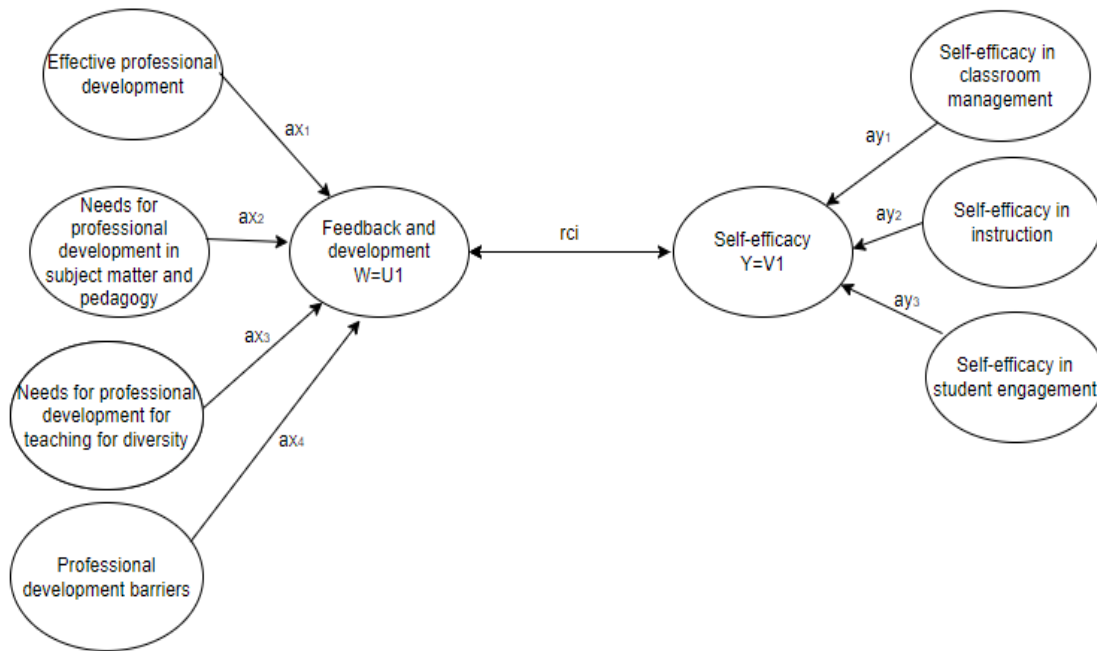


Figure 1: Conceptual model for canonical correlation analysis

Figure 1 shows the conceptual model of the variable sets determined within the scope of the research. Accordingly, axi and ayi indicate canonical loadings, and rci indicates the correlation value.

FINDINGS

The mean, standard deviation and correlation values of the variables determined within the scope of the research are given in Table 1.

Table 1: Descriptive statistics and correlation values of variables

Variables	Mean	Std.dev.	1	2	3	4	5	6	7
Effective professional development	13,47	2,80		-,15**	-,08**	-,04**	,09**	,11**	,12**
Professional development barriers	8,98	2,06			,22**	,19**	-,11**	-,12**	-,12**
Need prof. devel. for teaching for diversity	9,76	2,48				,49**	-,16**	-,19**	-,20**
Need prof. devel. in subject matter and pedagogy	9,38	2,12					-,19**	-,21**	-,21**
Self-efficacy in classroom management	12,66	2,03						,66**	,69**
Self-efficacy in instruction	12,62	2,16							,71**
Self-efficacy in student engagement	12,13	2,18							

*.p<.01

When the correlation values related to teachers' self-efficacy and teachers' professional development were examined in Table 1, it was concluded that the highest correlation value was between "Need professional development in subject matter and pedagogy" and "Self-efficacy in student engagement" sub-dimensions ($r = -.20$; $p < .01$). But, the lowest correlation value was found between "Effective professional development" and "Self-efficacy in classroom management" ($r = .09$; $p < .01$). It was concluded that these correlation values were significant ($p < .01$).

The canonical correlation analysis results of the variable sets are given in Table 2.

Table 2: Canonical correlation analysis results for variables

Roots	r_c	r_c^2	Eigenvalues	Wilks' Lambda	F	df	p
1	,28	,09	,99	,74	12,00	26963,14	,00
2	,04	,00	,92	,28	6,00	20384,00	,09

Table 2 shows that the first canonical variable pair is significant (Wilks' Lambda=74.53; $F=12.00$, $p < .05$). When the correlation values of the canonical variable in question were examined, it was calculated as .28. According to the square of this value, we conclude that the first pair of canonical variables accounts for 9% of the variance. Wilks's Lambda, the ratio of within-group variability to total variability on the discriminant variables, is an inverse measure of the significance of the functions. Values close to 1 indicate that almost all of the variability in the discriminant variables is due to within-group differences (differences between cases in each group); values close to 0 indicate that almost all of the variability in the discriminant variables is due to group differences (Tinsley & Brown, 2000). According to the Wilks' Lambda value obtained within the scope of the research, it shows that very little of the variability in the first function is due to differences between groups. However, eigenvalues show the ratio of between-group variability to within-group variability for a function. The larger the eigenvalue, the better the discriminant variables loaded on the function explain group differences (Tinsley & Brown, 2000). According to the eigenvalues given in Table 2, it can be concluded that the first function explains the within-group variability better. As a result of the canonical correlation analysis, the correlation coefficients and canonical loadings of the variables in the sets are given in Table 3.

Table 3: Correlation coefficients and loadings of variables

Variables	r_{cl}	
	Correlation coefficient	Canonical Loadings
<i>First set</i>		
Effective professional development	-,35	-,44
Professional development barriers	,21	,46
Need prof. devel. for teaching for diversity	,41	,75
Need prof. devel. in subject matter and pedagogy	,55	,80
Variance explained	,03	
<i>Second set</i>		
Self-efficacy in classroom	-,09	-,77

management		
Self-efficacy in instruction	-,48	-,92
Self-efficacy in student engagement	-,52	-,93
Variance explained	,01	

When Table 3 is examined, according to the explained variance values, the first set shares 3% of the variance and the second set shares 1%. In addition, according to the canonical loadings, it was calculated that the most important contributing variable was "Self-efficacy in student engagement" (-93%). On the other hand, the lowest contributing variable was found to be "Effective professional development". However, the fact that the canonical loadings are greater than .30 (Tabachnick & Fidell, 2007) shows that it is a part of the variable set in question. Accordingly, it is seen that the variable "Professional development barriers" is not a part of the first set (.21). In addition, it was concluded that the variable "Self-efficacy in classroom management" was not a part of the second set (-.09). The canonical loadings values of the canonical correlation analysis and the correlations between the variables are given in Figure 2.

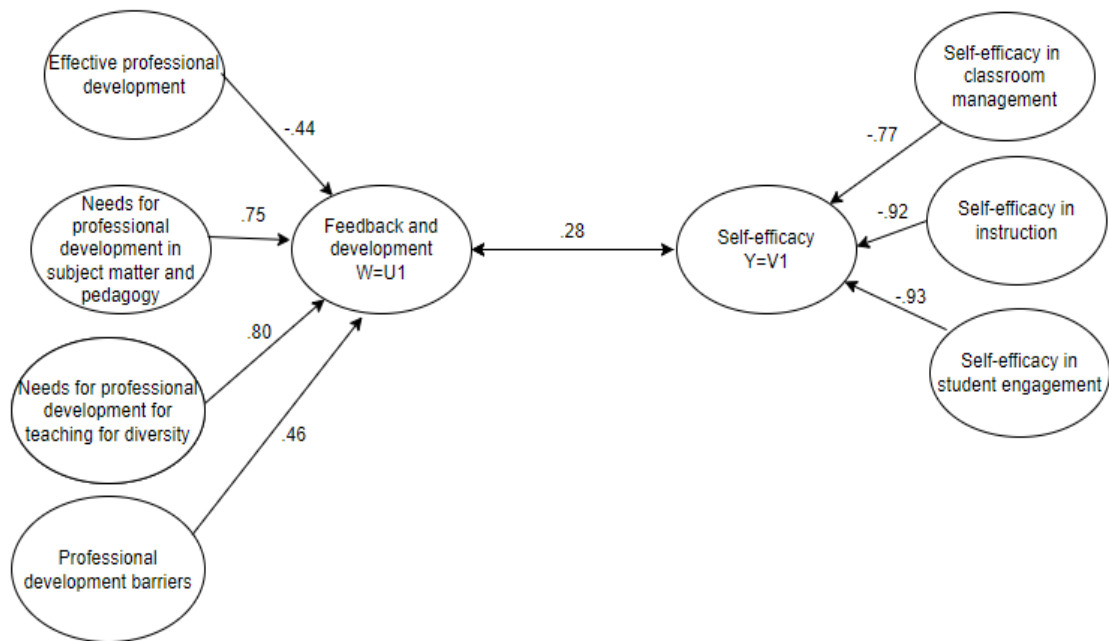


Figure 2: Canonical loadings and correlation value of variable sets

Figure 2 shows the canonical loadings and correlation values of the variable sets of teachers' professional development and self-efficacy. There is a significant ($p < .05$) and positive relationship between these variable sets.

CONCLUSIONS

The aim of this study is to examine the relationship between teachers' professional development and self-efficacy. For this purpose, canonical correlation analysis was conducted. According to the findings, it was concluded that the highest correlation value related to teachers' self-efficacy and teachers' professional development was found between "Need professional development in subject matter and pedagogy" and "Self-efficacy in student engagement" sub-dimensions. When the related literature is examined, it supports the findings obtained. For example, according to Borko (2004), increasing teachers' professional development programs in the subject area and having experiences that enable teachers to attend in activities such as solving mathematical problems and conducting scientific experiments as learners play an effective and important role in increasing self-efficacy beliefs in student engagement. In addition, Woods and Weasmer (2004) concluded in a study that increasing teaching performance in teachers' professional development positively affects student engagement and increases teacher self-efficacy.

According to the Wilks' Lambda value obtained within the scope of the research, it shows that very little of the variability in the first function is due to intergroup differences. However, the first canonical variable pair was found to be significant. In addition, according to the explained variance values, the first set shares 3% of the variance and the second set shares 6%. In addition, according to the canonical loadings, it was calculated that the

most important contributing variable was "Self-efficacy in student engagement" (-93%). On the other hand, the lowest contributing variable was found to be "Effective professional development". Barrera-Pedemonte (2016), in a study conducted on the TALIS 2013 application, concluded that teachers with high professional development contribute to student achievement by increasing students' learning in the classroom. The increase in student achievement also affects teacher self-efficacy. In addition, professional development programs not only provide teachers with new knowledge and skills, but also allow them to spend time on practices that will enable students to actively participate in the lesson (Meiers & Ingvarson, 2005).

Another finding of the study is that there is a significant ($p < .05$) and positive relationship between the variable sets of teachers' professional development and self-efficacy. Tran (2014) supported other studies in the literature and found that teachers' participation in professional development programs increased their self-efficacy. It can be concluded that effective professional development will increase student achievement by diversifying teachers' teaching practices in the classroom environment. Within the scope of the research, recommendations are organized and presented below.

- School administrators can provide opportunities for teachers' professional development by encouraging teachers' communication and collaboration with each other and supporting teachers to learn more. This can increase teachers' self-efficacy and improve their achievement.
- Policy practitioners can allow teachers to have more autonomy in choosing textbooks and teaching formats.
- Create a system of professional counseling to support student and teacher psychology in schools to solve problems.
- Teachers' opinions and suggestions should be taken into account in professional development activities not only as participants but also as decision makers.
- In future studies, different variables in the TALIS questionnaire can be used with different analysis methods.

There are some limitations within the scope of the research. First of all, the research is limited to the teachers who participated in TALIS 2018. It is also limited to the questions used in the questionnaire in TALIS 2018. On the other hand, the answers given by the teachers were evaluated only at one time point. In addition, the interaction between teachers' self-efficacy and professional development also limits the correlation between variables.

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