Examining the Relationship Between Teachers' Professional Development and Motivation in The Context of 21 st Century Skills

21. Yüzyıl Becerileri Bağlamında Öğretmenlerin Mesleki Gelişimi ile Motivasyonu Arasındaki İlişkinin İncelenmesi

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Abstract

The purpose of this study is to examine the relationship between teachers' professional development self-efficacy and autonomous motivation in the context of 21st century skills through various variables. A qualitative-supported quantitative research method study was conducted with 200 teachers working in Antalya province. "Teachers' Professional Development Self-Efficacy Scale" and "Inventory of Autonomous Motivation in Teaching" were used to collect data. A semi-structured interview form was used as the qualitative data collection. The t-test, one-way analysis of variance, Pearson's correlation coefficient, and regression analysis were used in the analysis. As a result of the research, it was concluded that teachers' professional development self-efficacy and autonomous motivation in teaching were at a good level. Moderate level, positive and significant relationships were found between teachers' professional development self-efficacy and autonomous motivation levels in teaching. Professional development self-efficacy levels were found to be a significant predictor of autonomous motivation levels in teaching.

Keywords: *Professional development, Self-efficacy, Autonomous motivation, Teacher*

Özet

Araştırmanın amacı, 21. yüzyıl becerileri kapsamında öğretmenlerin mesleki gelişim öz yeterlikleri ile özerk motivasyonları arasındaki ilişkiyi çeşitli değişkenler üzerinden incelenmesidir. Nitel destekli nicel araştırma yöntemi kullanılan araştırmanın çalışma grubunu Antalya İlinde görev yapan 200 öğretmen oluşturmaktadır. Veri toplama araçları olarak "Öğretmenlerin Mesleki Gelişim Öz Yeterlikleri Ölçeği" ile "Öğretimde Özerk Motivasyon Envanteri" kullanılmıştır. Nitel veri toplama için yarı yapılandırılmış görüşme formu kullanılmıştır. Verilerin analizinde t-testi, tek yönlü varyans analizi, Pearson Momentler Çarpımı Korelasyon Katsayısı ve Regresyon Analizi kullanılmıştır. Araştırma sonucunda, öğretmenlerin mesleki gelişim öz yeterlikleri ve öğretimde özerk motivasyonlarının iyi düzeyde olduğu sonucuna ulaşılmıştır. Öğretmenlerin mesleki gelişim öz yeterlikleri ile öğretimde özerk motivasyon düzeyleri arasında orta düzeyde pozitif ve anlamlı bir ilişki tespit edilmiştir. Mesleki gelişim öz yeterlik düzeyleri, öğretimde özerk motivasyon düzeylerinin anlamlı bir yordayıcısı olduğu görülmüştür.

Anahtar kelimeler: *Mesleki gelişim, Özyeterlik, Özerk motivasyon, Öğretmen*

INTRODUCTION

Teachers are the critical point in achieving the desired goals in the education (George & Sabapathy, 2011). The usefulness of the education system depends on teachers, who have a very important role in providing students with the targeted qualities among elements such as teachers, administrators, curriculum, technology, socioeconomic conditions (Caprara et al., 2006). It is of great importance that teacher competencies, which will directly affect teaching, are at a high level (Charalambous, 2015). 21st century skills are among the skills that are targeted to be brought into education (Ünlü et al., 2019). Teachers' perceptions of self-efficacy are related to 21st-century skills. As teachers' perceptions of self-efficacy improve, their motivation, communication, and critical thinking skills can improve (Dilci & Yıldız, 2012). The goal is to develop individuals who are open to lifelong learning, highly motivated, and have developed self-efficacy with 21st-century skills (Geisinger, 2016). Teachers who can develop 21st-century skills can also educate their students in this direction (Ciğerci & Ayık, 2022). The development of students' 21st-century skills is associated with teachers' proficiency in these skills (Kamisah & Neelavany, 2010). Teachers with advanced 21st-century skills are highly motivated, have well-developed communication skills, and possess high self-efficacy, which is why they perform their profession willingly and with dedication (Shukla, 2014).

Teachers' professional development is among the most fundamental elements that need to be considered to achieve the intended changes in the education system (Yenen & Kılınç, 2021). Therefore, teachers' professional development self-efficacy should be given due importance (Van Driel et al., 2012). Teachers' professional development self-efficacy is a concept that includes shaping all teaching activities in a productive way and following new developments (Avalos, 2011). Self-efficacy perceptions are important in teachers' teaching performances and individual competencies (Riggs & Enochs, 1990). Self-efficacy (Bandura, 1993), which is the belief of individuals to realize their responsibilities, is considered as the basic component of qualified teachers (Chacon, 2005). Teachers' teaching activities are closely related to their professional competencies (Kulshrestha & Pandey, 2013). Today, general competencies for the teaching profession include three main competency areas: "professional knowledge", "professional skills", "attitudes and values". Professional knowledge includes field knowledge, professional skills include controlling the education process, attitudes and values include national and spiritual values, personal and professional development sub-competencies (Ministry of National Education, 2017). Professional development is the key to teachers' high performance in their teaching (Caprara et al., 2006; Desimone

et al., 2002; Odabaşı & Kabakçı, 2007). Professional development has four dimensions; instructional development, areal development, personal development and organizational development (Moeini, 2003; Kabakçı, 2005). Teachers' professional development also develops in terms of individual characteristics such as motivation and attitude (Fraser et al., 2007). According to Self-Determination Theory, autonomous motivation and individual achievement are related (Ryan & Deci, 2000). Autonomously motivated teachers are more creative and willing to organize teaching activities in the teaching process (Roth et al., 2007). According to Koka et al. (2021), teachers' autonomous motivation in education directly affects their teaching experiences. Teachers' autonomous motivation is the most fundamental condition for professional development and participation in continuous professional development (Shulman & Shulman, 2009). Another important component in the effectiveness of the education process is teachers' motivation to teach. High motivation of teachers makes teaching practices efficient. Teachers' motivation is a factor that shapes both academic achievement and professional development (Hasibuan, 2022; Yarım & Ada, 2022; Ng & Ng, 2015). Teachers with high professional development self-efficacy can motivate students better (Guskey, 2002). Therefore, autonomously motivated teachers are more diligent in their teaching practices and eager to diversify their teaching activities (Roth et al., 2007). From this perspective, teachers' professional development self-efficacy and autonomous motivation in teaching constitute important elements of the effectiveness of the education process. When the literature is examined, studies on teachers' professional development; professional development self-efficacy (Güdücü & Çemrek; 2022; Yang, 2020), professional self-efficacy (Kahyaoğlu & Yangın, 2007; Yenen, 2022; Yaman et al., 2013), perceptions of professional development (Güvenç, 2011; Oruç et al., 2014), attitudes and opinions towards professional development (Ceylan & Özdemir, 2016; Saberi & Amiri, 2016) in areas such as. Geijsel et al. (2009), Yazıcı and Gündüz (2011) in their studies, they stated that teachers' professional development contributed positively to their professional teaching, affected teacher efficacy and increased students' achievement. According to Brick et al. (2021), teachers' professional development can change teachers' characteristics such as self-efficacy and motivation. Teachers' professional self-efficacy, attitudes and motivation have a very important role in influencing their teaching (Korur et al., 2016; Van Droogenbroeck et al., 2014). Poulou (2007) also stated that motivation is one of the factors affecting teacher efficacy. Barni et al. (2019) stated in their study that self-efficacy varies depending on teachers' motivation. Caprara et al. (2003) suggested that teachers' self-efficacy has a significant effect on learning motivation. Fachmi et al. (2021), Watt and

Richardson (2007) emphasize that teachers' teaching motivation directly affects their professional development and professional performance. Similarly, Haryaka and Sjamsir (2021) stated in their study that teachers' motivation in teaching will affect their professional development competencies. Teachers' self-efficacy is a powerful factor affecting teachers' behavior, effort and motivation in the classroom (Henson, 2002; Klassen & Tze, 2014). Teachers' autonomous motivation in teaching supports students in education, improves teachers' teaching performance and increases enthusiasm in teaching and learning (Van den Berghe et al., 2014). According to Main and Hammond (2008), teachers with high self-efficacy and motivation for teaching are more effective in teaching and have a view that focuses on students. A similar result is seen in Kalyar et al. (2018), Skaalvik and Skaalvik (2009) found that teachers' self-efficacy and motivation had a positive effect on their teaching. Kozikoğlu and Altunova (2018) state that there is a positive relationship between teacher candidates' perceptions of self-efficacy regarding 21st-century skills and their lifelong learning motivation. In Win and Min's (2020) study with 373 teachers, findings showed that teachers' self-efficacy was positively related to autonomous motivations in teaching. Autonomously motivated teachers find it interesting to participate in teaching performances and are more willing to do so. It has been shown that the higher the self-efficacy of teachers, the higher their autonomous motivation in teaching. Kozikoğlu and Özcanlı (2020) state that there is a moderate, positive, and significant relationship between the dedication to the profession of 370 teachers working in different branches and their 21st-century teaching skills. Kula (2022), in his study with 364 pre-service teachers, suggested that there was a significant relationship between teaching self-efficacy beliefs, attitudes towards teaching and teaching motivation levels and that teaching motivation and teaching profession self-efficacy beliefs had a significant effect on attitudes towards teaching. Therefore, it is important to determine the levels of teachers' professional development self-efficacy and autonomous motivation and to explain the relationship between them. The limited number of studies in this field makes this study important. It was aimed to reveal the relationship between teachers' professional development self-efficacy and their autonomous motivation in teaching and to examine it through various variables. According to the quantitative data obtained, semi-structured interviews were conducted with the teachers. For this purpose, the research questions were formulated as follows.

1) What is the level of teachers' professional development self-efficacy and autonomous motivation in teaching?

2) Do teachers' professional development self-efficacy and autonomous motivation in teaching show statistically significant differences according to gender, branch and educational status?

3) Is there a significant relationship between teachers' professional development self-efficacy and their autonomous motivation in teaching?

4) Is teachers' professional development self-efficacy a significant predictor of their autonomous motivation in teaching?

5) What are teachers' views on professional development self-efficacy and autonomous motivations in teaching?

METHOD

Research Design

In this study, qualitative-supported quantitative research method was used. It is a research design that is primarily based on quantitative research but utilizes qualitative data to better understand, explain, or deepen quantitative data (Creswell, 2014). For quantitative measurements, descriptive survey design has been used since it is aimed to determine the relationship between teachers' professional development self-efficacy and their autonomous motivation in teaching. Descriptive survey design is the explanation of an existing event or situation as it is (Fraenkel & Wallen, 2006). A case study design has been used for qualitative measurements. The distinctive feature of this design is the in-depth study of a current event or situation. (Yin, 2011).

Participants

The study group of research consisted of 200 teachers working in Antalya province. Maximum variation sampling method, one of the purposive sampling methods, was used to determine the study group. The aim is to maximize the variety of individuals who may be involved in the problem (Büyüköztürk et al., 2014). Data were collected through online forms and face-to-face. Although face-to-face interviews are often used to collect data, if face-to-face collection is not possible for some reasons, data can be collected through various means such as online tools and e-mail in order not to lose data (Meho, 2005). In the study, 61% (n=122) of the teachers were women and 39% (n=78) were men. According to their educational status, 78.5% were undergraduate (n=157) and 21.5% were postgraduate (n=43).

In the qualitative dimension of the research, semi-structured interviews were conducted with 6 teachers consisting of Science and Mathematics teachers, who were

determined by typical case sampling from purposive sampling type, and they were asked to share their opinions in writing. Pseudonyms (S1, S2, S3 Science teachers; M1, M2, M3 Mathematics teachers) were used for the teachers who participated in the interviews. Before the application, the purpose of the study was explained to the teachers and voluntariness was taken as a basis. It was confirmed that the data to be collected would be used only for this study. The data obtained from the research is suitable for analysis by another researcher, with the teachers' names protected. The thematic analysis of the qualitative data was conducted independently by the first and second researchers. The agreement between the two codings was over 80%. This consistency indicates that the study is reliable (Miles & Huberman, 1994).

Instrument and Procedures

The quantitative data of this study were collected with the Teachers' Professional Development Self-Efficacy Scale developed by Yenen and Kılınç (2021) consisting of 20 items and 4 factors and the Inventory of Autonomous Motivation in Teaching developed by Roth et al. (2007) and adapted into Turkish by Sarı and Tanrıöğen (2019) consisting of 16 items and 4 factors. The scale and inventory were administered to volunteer teachers at the same time.

Teachers' Professional Development Self-Efficacy Scale

It consists of 20 items in a four-factor 5-point Likert type. There are no negative items in the scale. The total reliability coefficient (Cronbach's alpha) of the scale by Yenen and Kılınç (2021) is .91, Cronbach Alpha reliability value of factor I Instructional Development (ID) for sub-dimensions is .86, Cronbach Alpha reliability value of Factor II Institutional Development (InstiD) .89, Cronbach Alpha reliability value of Factor III Personal Development (PD) is .88, the Cronbach Alpha reliability value of Factor IV Field Development (FD) was reported as .78. As a result of the confirmatory factor analysis, fit index values of the four-factor model were GFI = .91, AGFI = .86, SRMR = .080, NFI = .93, NNFI = .95, CFI = .96, $\chi 2$ / sd = 2.69, RMSEA = .081.

Autonomous Motivation Inventory in Teaching

Autonomous Motivation the Inventory of in Teaching developed by Roth et al. (2007) based on Ryan and Deci (2000)'s Self-Determination Theory adapted to Turkish by Sarı and Tanrıöğen (2019). There are no negative items in the 5-point Likert-type inventory consisting of 16 items and 4 sub-dimensions A minimum score of - 48 and a maximum score of + 48 can be obtained from the inventory. An increase in the score obtained from the inventory means that teachers' self-determined motivation levels increase,

while a decrease in the score means that teachers' non-self-determined motivation levels increase. The reliability coefficient (Cronbach α) of the scale for each sub-dimension was found to be .86 for External Regulation (ER), .74 for Introjected Regulation (IntR), .88 for Identified Regulation (IdenR) and .77 for Intrinsic Regulation (IntsR). As a result of the confirmatory factor analysis, χ^2/sd = 2.409, RMSEA= .068, SRMR = .066, CFI= .95, TLI(NNFI) = .95.

Interviews

A semi-structured interview form was created by the researchers was used as the qualitative data collection tool of the study. Semi-structured interviews are active interactions in line with the interpretive approach (Fontana & Frey, 2000). The questions asked in the semi-structured interview are as follows: What are your views on the factors affecting teachers' Professional Development Self-Efficacy? What are your views on the factors affecting teachers' autonomous motivation in teaching? Do you think there is a relationship between teachers' Professional Development Self-Efficacy and their Autonomous Motivation in Teaching? Why?

Data Analysis

The data were analyzed using the SPSS 23.0 programs. Independent samples t-test was used to examine whether teachers' professional development self-efficacy and autonomous motivation levels in teaching differ significantly according to gender and educational status variables. One-way analysis of variance ANOVA was used to examine whether there was a significant difference according to their branches. Pearson Correlation Coefficient Analysis was used to determine the relationships between teachers' professional development self-efficacy and autonomous motivation levels in teaching. The predictor variable of the study was determined as teachers' professional development self-efficacy and the predicted variable as teachers' autonomous motivation in teaching and Simple Linear Regression Analysis was used to examine the predictive power. Content analysis was used in semi-structured interviews with teachers.

RESULTS

Skewness and kurtosis values between -1.5 and +1.5 indicate that the distribution is normal (Tabachnick & Fidell, 2013). For some studies, variables in the range of -2 to +2 can be considered normally distributed (George & Mallery, 2016; Çokluk et al., 2012). In this case, it was determined that the data were normally distributed.

This section presents the results of the sub-problems.

1) What is the level of teachers' professional development self-efficacy and autonomous motivation in teaching?

The data on the distribution of teachers' scores on the scales of professional development self-efficacy and autonomous motivation in teaching are given in Table 1.

Table 1

Descriptive Statistics Results of Teachers' Scores from Professional Development Self-Efficacy and Autonomous Motivation in Teaching Scales by Dimension

Scale	Dimensions	$\bar{x}$	SD	N
Professional Development Self-efficacy	Instructional D.	3.90	.52	200
	Institutional D.	3.78	.51	
	Personal D.	3.64	.44	
	Field D.	3.76	.51	
Autonomous Motivation in Teaching	External Regulation	1.87	.71	200
	Introjected Regulation	2.61	1.00	
	Identified Regulation	3.63	.62	
	Intrinsic Regulation	4.07	.61	

When Table 1 is analyzed, the mean scores of teachers' professional development self-efficacy (PDS) scale on the basis of dimensions are $\bar{x}$= 3.90 for the Instructional Development (ID) sub-dimension, $\bar{x}$= 3.78 for the Institutional Development (InstiD) sub-dimension, $\bar{x}$= 3.64 for the Personal Development (PD) sub-dimension and for the Field Development (FD) sub-dimension, $\bar{x}$= 3.76. "Instructional Development (ID)" ($\bar{x}$=3.90) is the sub-dimension that teachers consider most adequate, "Personal Development (PD)" ($\bar{x}$=3.64) is the sub-dimension that teachers consider the least adequate. In Table 1, the dimension-based averages of the scores they received from the autonomous motivation in teaching (AMT) scale for the External Regulation (ER) sub-dimension $\bar{x}$= 1.87, $\bar{x}$ = 2.61 for the sub-dimension of Introjected Regulation (IntR), $\bar{x}$=3.63 for the Identified Regulation (IdenR) sub-dimension and for the Intrinsic Regulation (IntsR) sub-dimension, $\bar{x}$= 4.07. The sub-dimension of the Autonomous Motivation in Teaching (AMT) scale that teachers consider the most adequate is " Intrinsic Regulation (IntsR)" ($\bar{x}$=4.07), "External Regulation (ER)" ($\bar{x}$=1.87) was the sub-dimension they considered the least adequate.

2) Do teachers' professional development self-efficacy and autonomous motivation in teaching show statistically significant differences according to gender, branch and educational status?

Whether teachers' professional development self-efficacy (PDS) and autonomous motivation in teaching (AMT) scores differed in terms of gender and educational status was determined by an independent samples t-test. The results obtained are presented in the tables below. The t-test results of teachers' professional development self-efficacy and autonomous motivation in teaching scale scores according to gender and educational status are given in Table 2 and Table 3. One-way analysis of variance ANOVA was used to determine whether there was a difference in the scores obtained in terms of branch, as given in Table 4.

Gender

Table 2

T Test Results of Teachers' Scores from Professional Development Self-Efficacy and Autonomous Motivation in Teaching Scales According to Gender

Scale	Dimensions	Gender	N	$\bar{x}$	SD	df	t	p
Professional	ID	Female	12	3.85	0.50	198	-1.53	.127
		Male	78	3.97	0.53			
Development	InstiD	Female	122	3.72	0.53	198	-2.34	.020
		Male	78	3.89	0.46			
Self-efficacy	PD	Female	122	3.65	0.45	198	0.59	.551
		Male	78	3.62	0.42			
	FD	Female	122	3.71	0.52	198	-1.79	.074
		Male	78	3.84	0.50			
	PDS	Female	122	3.74	0.40	198	-1.68	.093
		Male	78	3.89	0.36			
Autonomous	ER	Female	122	1.84	0.71	198	-0.74	.460
		Male	78	1.92	0.71			
Motivation	IntR	Female	122	2.53	1.02	198	-1.43	.150
		Male	78	2.74	0.97			
In Teaching	IdenR	Female	122	3.61	0.58	198	-0.43	.665
		Male	78	3.65	0.67			
	IntsR	Female	122	4.12	0.61	198	1.72	.086
		Male	78	3.65	0.60			
	AMT	Female	122	3.13	0.45	198	-0.29	.767
		Male	78	3.15	0.49			

When the whole scale of teachers' professional development self-efficacy (PDS) is examined in Table 2, no significant difference was found according to their gender [$t_{(198)}$=-1.68; p>.05]. When the scores of teachers' professional development self-

efficacy scale (PDS) were examined based on sub-dimensions, a significant difference was found in favor of male teachers ($\bar{x}$= 3.89) in the sub-dimension of Institutional Development (InstiD) (t=-2.34; p<.05) according to the gender variable of the teachers.

In Table 2, when the autonomous motivation in teaching (AMT) scale was examined for the whole scale, no significant difference was found according to the gender of the teachers [$t_{(198)}$=-0.29; p>.05].

Education Status

Table 3

T Test Results of Teachers' Scores from Professional Development Self-Efficacy and Autonomous Motivation in Teaching Scales According to Educational Status

Scale	Dimensions	Education Status	N	$\bar{x}$	SD	df	t	P
Professional Development	ID	Undergraduate	157	3.87	0.51	198	-1.64	.101
		Postgraduate	43	4.01	0.52			
	InstiD	Undergraduate	157	3.76	0.51	198	-1.29	.197
		Postgraduate	43	3.87	0.49			
Self-efficacy	PD	Undergraduate	157	3.63	0.44	198	0.66	.509
		Postgraduate	43	3.68	0.43			
	FD	Undergraduate	157	3.71	0.50	198	-2.96	.003
		Postgraduate	43	3.97	0.52			
	PDS	Undergraduate	157	3.75	0.39	198	-2.05	.041
		Postgraduate	43	3.89	0.35			
Autonomous Motivation in Teaching	ER	Undergraduate	157	1.86	0.74	198	-0.37	.706
		Postgraduate	43	1.91	0.62			
	IntR	Undergraduate	157	2.64	1.01	198	0.82	.408
		Postgraduate	43	2.50	0.96			
	IdenR	Undergraduate	157	3.64	0.61	198	0.57	.563
		Postgraduate	43	3.58	0.65			
	IntsR	Undergraduate	157	4.07	0.61	198	0.33	.735
		Postgraduate	43	4.04	0.61			
	AMT	Undergraduate	157	4.07	0.61	198	0.33	.735
		Postgraduate	43	3.10	0.49			

In Table 3, when the professional development self-efficacy (PDS) scale was examined for the whole scale according to the educational status of the teachers [$t_{(198)}$=2.05; p<.05], a significant difference was found between teachers with undergraduate degrees ($\bar{x}$= 3.75; SD=.39) and teachers with postgraduate degrees ($\bar{x}$= 3.89; SD=.35) in favor of teachers with postgraduate degrees. When the scores of teachers' professional development self-efficacy (PDS) scale were examined based on sub-dimensions, a significant difference was found in favor of postgraduate teachers ($\bar{x}$= 3.97) in the sub-dimension of Field Development (FD) (t=-2.96; p<.05).

In Table 3, when the autonomous motivation in teaching (AMT) scale was examined for the whole scale according to the educational status of the teachers [$t_{(198)}$=0.51; p>.05] no significant difference was found.

Branch

Descriptive statistical findings and one-way analysis of variance results regarding the distribution of teachers' professional development self-efficacy (PDS) and autonomous motivation in teaching (AMT) scales scores according to their branches are given in Table 4.

Table 4

Variance Analysis of Teachers' Scores from Professional Development Self-Efficacy and Autonomous Motivation in Teaching Scales According to Branch

Scale	Source of Variance	Sum of Squares	df	Mean Square	F	p
PDS	Between Groups	3.265	20	.163	1.077	.377
	Within Groups	27.137	179	.152		
	Total	30.402	199			
AMT	Between Groups	4.068	20	.203	.913	.571
	Within Groups	39.865	179	.223		
	Total	43.933	199			

In Table 4, no significant difference was observed in terms of branches (F=1.077; p>.05) in teachers' professional development self-efficacy scale (PDS). In the autonomous motivation in teaching (AMT) scale, there was no significant difference between the branches (F=.913; p>.05).

3) Is there a significant relationship between teachers' professional development self-efficacy and their autonomous motivation in teaching?

The relationship between teachers' professional development self-efficacy (PDS) and their autonomous motivation in teaching (AMT) is given in Table 5.

In Table 5, it is seen that teachers' professional development self-efficacy (PDS) level ($\bar{x}$=3.78, SD=.39) is high and autonomous motivation in teaching (AMT) ($\bar{x}$=3.13, SD=.46) is at a moderate level. Table 5 shows that there is a moderate level, positive and significant relationship between teachers' professional development self-efficacy (PDS) and their autonomous motivation in teaching (AMT) (r=.368; p<.01). If the correlation coefficient is between .70-.30, it is defined as medium level, and if it is less than .30, it is defined as low level (Köklü et al., 2006).

Table 5

Descriptive Statistics and Correlation Results of Variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. PDS	1									
2. AMT	.368**	1								
3. ID	.854**	.331**	1							
4. PD	.693**	.249**	.421**	1						
5. InstiD	.768**	.268**	.509**	.396**	1					
6. FD	.788**	.289**	.631*	.418**	.462**	1				
7. ER	-.006	.634**	-.011	.032	.007	-.048	1			
8. IntR	.038	.705**	.000	.052	.071	.002	.521**	1		
9. IdenR	.441**	.746**	.428**	.279**	.269**	.387**	.192**	.320**	1	
10. IntsR	.513**	.563**	.476**	.305**	.365**	.438**	-.047	-.001	.528**	1
Mean	3.78	3.13	3.90	3.64	3.78	3.76	1.86	2.61	3.63	4.07
SD.	.39	.46	.52	.44	.51	.51	.71	1.00	.62	.61

**p<.01

4) Is teachers' professional development self-efficacy a significant predictor of their autonomous motivation in teaching?

Table 6

Regression Analysis Results of Predictive Relationships between Teacher Professional Development Self-Efficacy and Autonomous Motivation in Teaching

Variable	B	Std. Error	β	t	p
Constant*	1.466	.302		4.853	,000
Professional Development Self-efficacy	.442	.079	.368	5.567	,000
R=0.368	R^2=0.135				
$F_{(1,198)}$= 30.990	p=0.000				

Table 6 shows that professional development self-efficacy (PDS) levels are a significant predictor of autonomous motivation in teaching (AMT) levels (R= 0.368, R^2=0.135, $F_{(1,198)}$= 30.990, p= 0.000). It can be stated that approximately 14% of the total variance of autonomous motivation in teaching (AMT) level is explained by professional development self-efficacy (PDS) level.

5) What are teachers' views on professional development self-efficacy and autonomous motivations in teaching?

The responses to the 3-question "Semi-structured interview form about teachers' views on professional development self-efficacy and autonomous motivations in teaching"

prepared by the researchers and formed by taking expert opinion were examined and presented.

What are your views on the factors affecting teachers' Professional Development Self-Efficacy?

The themes and some of the opinions formed in line with the answers given by the teachers are given in Table 7.

Table 7

Themes and Some Opinions Related to the Responses to the Semi-structured Interview Form Regarding Teachers' Professional Development Self-Efficacy

Themes
Teaching motivation *S2, "…if teachers' motivation is high, they will try to increase their professional efficacy more and their professional burnout will be less."*
Field knowledge *M1, "I think that teachers who have trained themselves in their field have high professional self-efficacy. For example, a mathematician who has mastered his field will want to continuously improve himself in his profession."*
School climate *M2, "I think school is a very important element in professional development for teachers. If your school administrators are not encouraging you for professional development, your professional self-efficacy will not be at a sufficient level."*
In-service training *S1"…In-service training is an important element in professional development. I believe that in-service trainings received during school time and interim vacations have a positive effect on professional development efficacy.*
Professional development *S3, "A teacher with high professional self-efficacy is not static and constantly follows innovations.*

What are your views on the factors affecting teachers' autonomous motivation in teaching?

The themes and some of the opinions formed in line with the answers given by the teachers are given in Table 8.

Table 8

Themes and Some Opinions Related to the Responses to the Semi-structured Interview Form on Autonomous Motivation in Teaching

Themes
Personal characteristics *M2, "I think personality characteristics affect motivation. Patience, productivity, creativity are inevitable in this profession. Those whose personality characteristics cannot struggle with difficulties will have low motivation."*
Professional development efficacy *S1, "Teachers with high professional development efficacy are more enthusiastic in teaching. They can learn methods they have not used before and are highly motivated to teach students."*

Table 8 (continued)

Themes and Some Opinions Related to the Responses to the Semi-structured Interview Form on Autonomous Motivation in Teaching

Themes
Professional experience *S2, "…. I think that teachers with more professional experience have higher motivation to teach. Their mastery of their field increases their motivation. However, in the opposite situation, the teaching motivation of those who have been teaching for a long time may decrease."* **Emotional exhaustion** *M3, "If a teacher does not like the school administration, does not get along with his/her colleagues and the achievement profile of the students is low, his/her motivation will decrease. They will experience emotional exhaustion and will not be happy."*

Do you think there is a relationship between teachers' Professional Development Self-Efficacy and their Autonomous Motivation in Teaching? Why?

Some of the teachers' opinions on this issue are as follows:

"I think there is a relationship between professional development self-efficacy and motivation in teaching. A professionally equipped teacher is more motivated in teaching." (S1)

"Considering that every teacher needs to renew himself/herself in his/her field, I feel that there will be a need for autonomous motivation in this regard and the two may be related." (S2)

"Teachers' continuous professional development efficacy and motivation are two factors that trigger each other, and highly motivated teachers are more enthusiastic in both teaching and professional development." (M3)

CONCLUSION, DISCUSSION, AND SUGGESTIONS

In this study, teachers' professional development self-efficacy and autonomous motivation in teaching were addressed. Teachers' professional development self-efficacy and autonomous motivation in teaching were examined in terms of various variables, and then the relationships between the two variables were examined.

In the study, it was concluded that teachers' professional development self-efficacy and autonomous motivation levels in teaching were at a moderate level. When we look at the mean scores of teachers' professional development self-efficacy scale, we see that they exhibited self-efficacy in instructional development, institutional development, field development and personal development sub-dimensions respectively. It can be stated that when teachers' professional self-efficacy is high, they perform teaching successfully and have a student-based approach (Chestnut, 2017; Main & Hammond, 2008). Teachers' self-efficacy in the teaching process affects the effectiveness of teaching and the ability to involve students in the process (Desimone et al., 2002;

Depaepe & König, 2018; Klassen & Chiu, 2010; Tschannen-Moran & Hoy, 2001). For the teacher, who is one of the cornerstones of education, there can be no progress in teaching without self-efficacy and motivation (Yarım & Ada, 2021). Affuso et al. (2022) and Mašková et al. (2022) argue that teachers' motivation is beneficial to the teaching process and students and increases the effectiveness of the learning process. Kozikoğlu and Altunova (2018) state that there is a positive relationship between teacher candidates' perceptions of self-efficacy regarding 21st-century skills and their lifelong learning motivation. Kozikoğlu and Özcanlı (2020) state that there is a moderate, positive, and significant relationship between the dedication to the profession of 370 teachers working in different branches and their 21st-century teaching skills. To Dilci and Yıldız (2012), as teachers' perceptions of self-efficacy develop 21 st-century skills (such as motivation, communication skills, and critical thinking skills) also develop. According to Shukla (2014), 21st-century skills are high in the self-efficacy and motivation of developed teachers.

In another result of the study, professional development self-efficacy and autonomous motivation in teaching did not differ according to gender and branch. In contrast to the research result, Ertürk (2016) argued that female teachers have more intrinsic motivation for teaching motivation than male teachers. In parallel with the research result, Akay and Boz (2011) found that gender had no effect on teacher self-efficacy. However, in contrast to this situation, Güdücü and Çemrek (2022) suggested that male teachers have higher professional development self-efficacy than female teachers. In the study, a difference was observed in favor of postgraduate teachers in terms of teachers' professional development self-efficacy according to their educational status. Similarly, Demir (2023) and Doğan (2020) argued in their studies that postgraduate teachers have higher awareness of teaching motivation and higher potential to act autonomously. While no difference was observed according to the branch in the study, Kahyaoğlu and Yangın (2007) found that the self-efficacy levels of pre-service mathematics teachers were lower than those of pre-service classroom teachers and pre-service science teachers.

In the study a moderate, positive and significant relationship was found between teachers' professional development self-efficacy and autonomous motivation in teaching. Similar to the findings of the study, Alev (2022) conducted a study with 426 primary school teachers in Turkey and found that teachers' professional efficacy positively affected their professional motivation. Teachers' motivation to teach is a factor that shapes both academic achievement and professional development

(Hasibuan, 2022; Yarım & Ada, 2022; Ng & Ng, 2015). Caprara et al. (2003) suggested that teachers' self-efficacy has a significant effect on learning motivation. Palmer (2002) also argued in his study that high self-efficacy affects high motivational awareness.

According to the regression analysis results, professional development self-efficacy levels are a significant predictor of autonomous motivation in teaching levels. Therefore, it can be said that teachers with high professional development self-efficacy have high levels of autonomous motivation in teaching. Similarly, Yıldız et al. (2021) stated that professional competence and efficacy were significant predictors of intrinsic and extrinsic motivation.

In the study, the themes given to the question "What are your views on the factors affecting professional development self-efficacy?" were formed as teaching motivation, field knowledge, school climate, in-service training and professional development. In parallel with these results, Poulou (2007) argued that motivation and personal characteristics affect professional efficacy. The effect of professional development on professional self-efficacy is an expected result. Papadopoulou and Yirci (2013) also found that motivation is one of the factors affecting professional development. In addition, school climate is also effective on teachers' professional self-efficacy (Demir, 2008). In-service training is utilized for the professional development of teachers (Atal & Sancar, 2020; Bayrakcı, 2009). Yenen (2022) argued that teachers should participate in in-service training for their professional efficacy, improve their field knowledge and increase their personal development. Teachers' field knowledge and pedagogical content knowledge affect professional development efficacy (Can, 2015). The themes given to the question "What are your views on the factors affecting autonomous motivation in teaching?" were personal characteristics, professional development efficacy, professional experience and emotional exhaustion. Similarly, Alam and Farid (2011) argued that teachers' motivation is influenced by factors such as teachers' personality, school environment, professional efficacy and socioeconomic status. In contrast to the research results, Tschannen-Moran and Woolfolk Hoy (2007) argued that professional experience is a good predictor of self-efficacy beliefs. Affective states affect motivation and professional efficacy (Usher & Pajares, 2008). In response to the question "Do you think there is a relationship between teachers' professional development self-efficacy and their autonomous motivation in teaching? Why?", teachers stated that they thought there was a relationship. Similarly, Fachmi et al. (2021), Haryaka and Sjamsir (2021), Watt and Richardson (2007) emphasize that teachers' teaching motivation affects their professional development efficacy and professional performance. The following recommendations can be made based on the

results of the study: The study can be conducted with teacher candidates. Factors affecting teachers' professional development and motivation can be investigated qualitatively.

Author Contributions

The first author performed data analysis, wrote introduction, findings and conclusion discussion. The second author wrote the methods and data collection.

Institutional Review Board Statement

This study was carried out with the ethics committee document dated 13.11.2023 and numbered 476 received from Akdeniz University, Social and Human Sciences ethics committee.

Conflict Declaration

There is no conflict between the authors.

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