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Investigating the Relationships Between Teachers' Attitudes Towards Professional Development and Their Professional Learning Together with Their Reflective Thinking Tendencies

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Abstract: In the present study, the relationships among teachers' attitudes towards professional development, professional learning, and reflective thinking tendencies were investigated. In the study designed using a relational survey model, the Attitude Towards Professional Development Scale, the Teacher Professional Learning Scale, and the Reflective Thinking Tendency Scale were used as data collection tools. The data were obtained from a total of 132 teachers working in public schools located in the city center of Isparta Province. The relevant data were analyzed using the SPSS software. In the analyses, independent samples t-tests, one-way ANOVA, Mann–Whitney U tests, Kruskal–Wallis tests, and Pearson correlation analyses were conducted. The results indicated significant and positive relationships between teachers' attitudes towards professional development, their professional learning, and their reflective thinking tendencies. Additionally, significant differences were found in teachers' professional learning levels based on the total number of students in the school (Collaboration sub-dimension) and their voluntary participation in professional development training (Collaboration and Reaching out to the Knowledge Base sub-dimensions). These differences favor teachers working in schools with higher student populations (500–1000 students) and those who voluntarily participate in professional development programs. Finally, significant differences were found in teachers' reflective thinking tendencies—specifically in the sub-dimensions of Continuous and Purposeful Thinking, Being an Investigator, and Career Perspective—based on the total number of students in their schools. These differences also favor teachers working in schools with higher student populations.

Keywords: teacher education, professional knowledge and skills, attitudes toward professional development, professional learning, reflective thinking

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Öğretmenlerin Mesleki Gelişime Yönelik Tutumlari ile Mesleki Öğrenme ve Yansitici Düşünme Eğilimleri Arasindaki İlişkilerin İncelenmesi

Özet: Bu araştırmada, öğretmenlerin mesleki gelişimlerine yönelik tutumları ile mesleki öğrenme ve yansıtıcı düşünme eğilimleri arasındaki ilişkiler incelenmiştir. İlişkisel tarama modelinde tasarlanan çalışmada veri toplama aracı olarak mesleki gelişime yönelik tutum ölçeği, öğretmen mesleki öğrenme ölçeği ve yansıtıcı düşünme eğilimi ölçeği kullanılmıştır. Veriler, Isparta il merkezindeki devlet okullarında görev yapan 132 öğretmenden elde edilmiştir. İlgili veriler, SPSS programı kullanılarak analiz edilmiştir. Analizlerde bağımsız t testi, tek yönlü varyans analizi, mann-whitney u testi, kruskal wallis testi ve pearson analizi uygulanmıştır. Ulaşılan sonuçlarda, öğretmenlerin mesleki gelişime yönelik tutumları ile mesleki öğrenme ve yansıtıcı düşünme eğilimleri arasında anlamlı ve pozitif yönlü ilişkiler bulunmuştur. Ayrıca öğretmenlerin mesleki öğrenme düzeyi ile okulun toplam öğrenci sayısı (işbirliği alt boyutu) ve mesleki gelişim eğitimine gönüllü katılım durumlarına göre (işbirliği alt boyutu ve bilgi tabanına ulaşma alt boyutu) anlamlı farklılıklar bulunmuştur. Bu farklılıklar yüksek öğrenci sayısının olan (500-1000 arası) ve gönüllü mesleki eğitimlere katılan öğretmenlerin lehinedir. Son olarak öğretmenlerin yansıtıcı düşünme eğilimleri ile (sürekli ve amaçlı düşünme, araştırmacı ve mesleğe bakış alt boyutları) okullarındaki toplam öğrenci sayısı arasında anlamlı farklılıklar bulunmuştur. Bu farklılık da okulunda yüksek öğrenci sayısının olduğu öğretmenlerin lehinedir.

Anahtar Kelimeler: Öğretmen eğitimi, mesleki bilgi ve beceri, mesleki gelişime yönelik tutum, mesleki öğrenme, yansıtıcı düşünme

INTRODUCTION

The renewed social structure and educational practices bring into question the necessity of teachers' development in terms of knowledge and skills. Pre-service training may be insufficient for knowledge of the values, achievements and skills of this day and age. It has become a prerequisite for teachers to have updated knowledge in their fields, master different teaching methods, and better understand their own weaknesses and strengths for their professional development.

Professional development refers to the planned actions of a teacher regarding the teaching process (Steinert, 2000). These actions are a set of efforts that are often supported by the school administrator and require collaboration with other teachers (Little, 1993). Guskey (2002) divided the factors affecting teachers' professional development into three: classroom practices, learning outcomes and change in student beliefs. It is possible for teachers to discover themselves through continuous development in their profession (Cafarella & Zinn, 1999), ensure continuity of learning (Chiriboga, 2003), and improve student achievement and behavior (Harootunian & Yargar, 1980). All these professional development outcomes can be achieved through teachers' continuous professional learning (Jansen in de Wal et al., 2014). Teachers with a high level of professional development are more open to improving their professional performance skills. These teachers feel

the importance of teaching more deeply and their job satisfaction also increases (Craft, 2002). In this context, the continuous professional development of teachers is one of the important factors in improving schools, increasing teacher quality, and ensuring student learning (Opfer & Pedder, 2011).

Professional learning is defined as the whole of practices in which teachers collaborate regularly, update their teaching with the feedback they receive from other teachers, and transfer the knowledge to their students and colleagues (Liu et al., 2016). In the professional learning process, the school principal, teacher motivation, educational policies, teachers' personality traits, school climate and culture, and colleague collaboration are all actively involved (Neves de Jesus & Conboy, 2001). It is possible for the teachers to support their own development through continuous learning and adapt to the education policies of the present era. In this process, teachers' personal and professional development progresses by supporting their learning and having reflective thinking skills.

Reflective thinking (Mok, 2010), which is a part of professional development, was initially defined by John Dewey as "an active persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends" (Dewey, 1933). The basic understanding of reflective thinking, based on today's constructivist teaching approach, is that the teacher analyzes their performance by asking themselves questions (Korthagen, 2011). For this reason, the qualities that a teacher are required to have been open-mindedness, responsibility and sincerity (Valli, 1997). Teachers are clearly faced with many choices every day, such as how to organize the classroom and curriculum, how to interpret student behavior, and how to protect learning time (Danielson et al., 2009). The basic skill they need in order to solve all these problems is to be able to reflect on implementing/evaluating the teaching process. Therefore, teachers can be supported to make different sense of their teaching practices, produce alternatives, be open to criticism, professional development and innovations, and be forward-thinking by evaluating the positive and negative aspects of the learning-teaching process (Rodgers, 2002).

A quality education system can be achieved by having quality teachers (Darling-Hammond & Synder 2000). This is only possible with teachers who support professional learning and development with reflective thinking skills. It is clear from the studies available in the relevant literature that there is a strong relationship between student success and teacher qualifications (Darling-Hammond & Synder, 2000; Heafner, 2019). It is possible for a teacher to develop them professionally through the increasing experience and examination of his or her own teaching practices. The teachers who tend to think reflectively relate theory to practice using a variety of sources of knowledge, examine their own practices and school policies in order to become better teachers, and use new evidence to reevaluate their decisions. These developments contribute to the professional development and learning of teachers.

As far as the common denominators of teachers' reflective thinking and professional learning in their professional development are concerned, it is remarkable that no study has been encountered on this subject in the relevant literature. When the factors affecting the professional development of teachers in studies on the subject are analyzed, it is clear that reflective thinking tendency (Chen & Seng, 1992; Maksimović & Osmanović, 2019), professional experience (Zhang et al., 2021), collaboration (Dodman, 2022; Hipp & Huffman, 2003; Kwakman, 2003; Ware & Kitsantas, 2007), financial gains (Alkar et al., 2023) and personal characteristics (Gemeda & Tynjälä, 2015) are effective. In this regard, the present study examined the relationship between teachers' attitudes towards professional development and their professional learning and reflective thinking tendencies, and the socio-demographic variables that may have an impact on these. The questions to be answered within the scope of the study are as follows:

1. What are the teachers' attitudes towards professional development, the levels of their professional learning and their reflective thinking tendencies?
2. Do the teachers' attitudes towards professional development, professional learning levels and reflective thinking tendencies differ by socio-demographic variables?
3. Is there a significant relationship between the teachers' attitudes towards professional development and their professional learning levels and reflective thinking tendencies?

METHODOLOGY

Research Design

Since the teachers' attitudes and tendencies were described quantitatively in the study, a correlational survey design was utilized. In this context, the relationship between quantitative variables (two or more) was aimed to be determined by correlation coefficient (Fraenkel et al., 2012).

Participant Group

The participant group consisted of a total of 132 branch teachers teaching in public secondary schools in the city center of Isparta province in the 2022-2023 academic year. Simple random sampling was utilized to create the participant group because the population group was very large. Therefore, it was aimed to easily perform the evaluation process and calculate sampling errors. The socio-demographic characteristics of the participant group are illustrated in Table 1.

Table 1. Socio-demographic Characteristics of the Participants.

Variables		N	%
Branch	Science	14	10.6
	English	13	9.8
	Maths	14	10.6
	Classroom teaching	34	25.8
	Social studies	10	7.6
	Turkish	19	14.4

	Other	28	21.2
Gender	Male	42	31.8
	Female	90	68.2
	Bachelor's degree	111	84.0
	Master's degree	21	16.0
Duration of seniority in the profession	1-5	5	3.8
	6-10	16	12.1
	11-15	39	29.5
	16-20	29	22.0
	over 21	43	32.6
Total number of students in the school	500 and below	57	43.2
	Between 500-1000	75	56.8
Voluntary participation in professional training	Yes	103	78.0
	No	29	22.0
Total		**132**	**100.0**

* The numerical distribution of other branches is as follows: Computer and Instructional Technologies (f=7), Religious Culture and Ethics (f=6); Guidance and Psychological Counseling (f=5), Visual Arts (f=4), Music Education (f=3), Preschool Education (f=2), and Physical Education (f=1).

Data Collection Tools and Analysis

Attitude Scale Towards Professional Development: The scale developed by Torff et al. (2005) was adapted by Özer and Beycioğlu (2010). The Cronbach's Alpha internal consistency coefficient of the five-point likert scale consisting of six items was calculated as .784. Factor analysis conducted after the scale, which originally had nine items, was translated into Turkish revealed a single-factor structure ranging from 0.433 to 0.827.

Teacher Professional Learning Scale: The scale developed by Liu et al. (2016) was adapted into Turkish by Gümüş et al. (2018). The scale consists of 4 dimensions and 27 items. Additionally, the internal consistency coefficient was calculated as .92 for the entire scale and .82, .83, .85, and .77 for the subscales, respectively. After adaptation, the Cronbach Alpha value of the scale is .92. The fit indices of the model obtained as a result of the confirmatory factor analysis of the scale were examined, and it was found that the four-factor model had RMSEA = .072, AGFI = .81, GFI = .85, NFI = .94, CFI = .96, SRMR = 0.040, and RMR = .061.

Reflective Thinking Tendency Scale (RTTS): The scale developed by Semerci (2007) consists of 35 items. After adaptation, the Cronbach's alpha coefficient of the scale is .90. According to the factor analysis results, KMO value of the RTTS was 0.91 and the value of Barlett test was 6811.46 ($p < .05$). In this scale, there are 7 factors. The results of the RTTS show that total correlation of items changed between 0.31 and 0.61 and it was found that the test-retest correlation was 0.74 ($p < .01$) and split half correlation coefficient was 0.77 ($p < .01$). The scale consisted of 20 negative and 15 positive items.

The data obtained in the study were analyzed using the SPSS program. In the analyses, independent t-test and one-way analysis of variance, Mann-Whitney U tests, Kruskal Wallis tests and pearson analyise were applied.

Validity and Reliability

In this study, descriptive statistical methods were used when evaluating the data. Cronbach's alpha was calculated to test the reliability of the scales. The Cronbach alpha values were calculated as 0.80 for the Attitudes Towards the Professional Development Scale, 0.92 for the Teacher Professional Learning Scale and 0.94 for the Reflective Thinking Tendency Scale. In the study, skewness and kurtosis values were examined to determine whether the scale data were normally distributed, and the results are presented in Table 2.

Table 2. Skewness and Kurtosis Values of Scale Data

	Descriptives	Skewness	Kurtosis
Attitude Scale Towards Professional Development		-1.254	1.121
Teacher Professional Learning Scale	Collaboration	-0.161	-0.715
	Reflection	-0.054	-0.664
	Experimentation	-0.578	-0.039
	Reaching out to the knowledge base	-0.400	0.605
Reflective Thinking Tendency Scale	Continuous and purposeful thinking	-1.422	1.180
	Open-mindedness	-1.277	1.191
	Questioning and effective teaching	-1.557	1.174
	Teaching responsibility and scientificness	-1.951	3.608
	Being an investigator	-1.281	1.346
	Being proactive and sincere	-1.539	1.318
	Career perspective	-0.953	1.031

It is important to examine whether skewness and kurtosis coefficients fall within specific ranges to assess the normality of the data. As stated by George and Mallery (2001), a skewness coefficient between -1 and 1 is considered an acceptable indicator of normality. A kurtosis coefficient between -2 and 2 is considered another indicator of normality. As shown in Table 2, the data in this study generally exhibit a normal distribution. Only the "Teaching responsibility and scientificness" dimension did not exhibit a normal distribution. "Ethical approval of the study was obtained by "Süleyman Demirel University Ethics Committee" on 15/03/2022 in accordance with the decision numbered 118/3."

RESULTS

In this section, descriptive statistical values for the scales included in the study are first presented. Next, the effects of teachers' socio-demographic variables on their attitudes towards professional development, professional learning levels, and reflective thinking tendencies are investigated. Finally, this section focuses on the degree of the relationships among the scales. The data obtained as a result of the analyses are illustrated in Table 3.

Table 3. Descriptive Statistical Values of the Scales Used in the Study

Scale and Dimensions	X	sd

Attitude Scale Towards Professional Development	3.86	0.56
Teacher Professional Learning Scale	4.28	0.42
Collaboration	4.36	0.49
Reflection	4.21	0.48
Experimentation	4.40	0.51
Reaching out to the knowledge base	4.14	0.51
Reflective Thinking Tendency Scale	4.26	0.42
Continuous and purposeful thinking	4.09	0.72
Open-mindedness	4.61	0.49
Questioning and effective teaching	4.66	0.52
Teaching responsibility and scientificness	4.20	0.91
Being an investigator	4.24	0.72
Being proactive and sincere	4.26	0.67
Career perspective	4.27	1.09

According to Table 3, the participants' mean score on the Professional Development Attitude Scale was 3.86; on the Teacher Professional Learning Scale, it was 4.28; and on the Reflective Thinking Tendencies Scale, it was 4.26. Among the sub-dimensions, the highest mean score was observed in the Experimentation sub-dimension of the Teacher Professional Learning Scale (4.40), while in the Reflective Thinking Tendencies Scale, it was the Questioning and Effective Teaching sub-dimension (4.66). The data obtained as a result of the analyses are illustrated in Table 4.

Table 4. Comparison of Attitude Scale Towards Professional Development Scores by the Socio-Demographic Characteristics

Variables		***X***	**sd**	**Test value**	**p**
Branch	Science	4.10	0.45	1.129***	0.350
	English	4.36	0.36		
	Maths	4.11	0.53		
	Classroom teaching	4.26	0.37		
	Social studies	4.29	0.45		
	Turkish	4.40	0.44		
	Other	4.23	0.38		
Gender	Male	3.76	0.63	-1.493**	0.138
	Female	3.91	0.53		
Education level	Bachelor's degree	3.86	0.58	-0.467**	0.641
	Master's degree	3.92	0.49		
Duration of seniority in the profession	1-5 years	4.20	0.25	0.735***	0.570
	6-10 years	3.83	0.49		
	11-15 years	3.79	0.59		
	16-20 years	3.94	0.43		

	over 21 years	3.86	0.66		
Total number of students in the school	500 and below	3.90	0.53	0.631**	0.529
	Between 500-1000	3.83	0.59		
Voluntary participation in professional training	No	3.83	0.74	1.911**	0.058
	Yes	3.91	0.58		
	No	3.69	0.39		

"*p<0.05, ** Independent t-test, ***One-way analysis of variance"

According to Table 4, there was no statistically significant difference between teachers' demographic characteristics and their total scores on the Professional Development Attitude Scale. The data obtained as a result of the analyses are illustrated in Table 5.

Table 5. Comparison of Teacher Professional Learning Scale Scores by the Socio-Demographic Characteristics of the Participants

Variables		***X***	**sd**	**Test value**	**p**
Branch	Science	4.10	0.45	1.27***	0.276
	English	4.36	036		
	Maths	4.11	0.53		
	Classroom teaching	4.26	0.37		
	Social studies	4.29	0.45		
	Turkish	4.40	0.44		
	Other	4.34	0.38		
Gender	Male	4.26	0.39	-0.311**	0.756
	Female	4.28	0.43		
Education level	Bachelor's degree	4.27	0.42	-0.289**	0.773
	Master's degree	4.30	0.45		
Duration of seniority in the profession	1-5	4.17	0.29	0.331**	0.857
	6-10	4.31	0.38		
	11-15	4.22	0.47		
	16-20	4.32	0.41		
	over 21	4.30	0.41		
Total number of students in the school	500 and below	4.24	0.40	0.873**	0.352
	Between 500-1000	4.30	0.43		
Voluntary participation in professional training	Yes	4.32	0.41	2.152**	**0.033***
	No	4.13	0.44		

*p<0.05, **Independent t-test, *** One-way analysis of variance

Independent samples t-tests and one-way ANOVA were conducted to compare the Teacher Professional Learning Scale scores based on socio-demographic characteristics, as shown in Table 5. Accordingly, the mean scores on the Teacher Professional Learning Scale were statistically significantly different for teachers who voluntarily participated in professional development training compared to those who did not. No statistically significant differences were found among the other variables. The data obtained as a result of the analyses are illustrated in Table 6.

Table 6. The Relationships Between Participants' Socio-Demographic Characteristics and the Collaboration and Reflection Sub-Dimensions of the Teacher Professional Learning Scale

Variables		Collabration		Reflection	
		$\underline{X}$	SD	$\underline{X}$	SD
Branch	Science	3.99	0.53	4.09	0.51
	English	4.58	0.43	4.19	0.45
	Maths	4.23	0.47	4.19	0.52
	Classroom teaching	4.32	0.46	4.19	0.44
	Social studies	4.42	0.49	4.16	0.56
	Turkish	4.54	0.55	4.34	0.51
	Other	4.39	0.40	4.24	0.50
	Test value		2.687***		0.431***
	p		0.057*		0.857
Gender	Male	4.32	0.51	4.18	0.52
	Female	4.37	0.48	4.23	0.47
	Test value		-0.621**		-0.556**
	p		0.536		0.579
Education level	Bachelor's degree	4.35	0.50	4.21	0.48
	Master's degree	4.37	0.43	4.21	0.56
	Test value		-0.119***		0.052***
	p		0.905		0.959
Duration of seniority in the profession	1-5	4.13	0.14	4.06	0.37
	6-10	4.19	0.59	4.31	0.48
	11-15	4.37	0.49	4.13	0.56
	16-20	4.44	0.44	4.20	0.43
	over 21	4.37	0.50	4.28	0.46
	Test value		0.992***		0.760***
	p		0.415		0.553
Total number of students in the school	500 and below	4.25	0.47	4.17	0.51
	500-1000	4.44	0.49	4.24	0.47
	Test value		-2.310**		-0.908**
	p		**0.022***		0.365
Voluntary participation in professional training	Yes	4.40	0.48	4.25	0.48
	No	4.20	0.49	4.07	0.48
	Test value	2.036**			1.798**
	p	**0.044***			0.074

"*p<0.05, **Independent t-test ***One-way analysis of variance"

Table 6 shows that there are statistically significant differences in the Collaboration subscale scores of the Teacher Professional Learning Scale based on the total number of students in the school and participants' voluntary participation in professional training (p<.05). Participants working in schools with a student population between 500 and 1000 have higher scores on the "Collaboration subscale" than those in schools with 500 or fewer students. Participants who voluntarily participated in professional development training had higher scores on the "Collaboration subscale" than those who did not. No statistically significant differences were

found among the other variables. The data obtained as a result of the analyses are illustrated in Table 7.

Table 7. The Relationships Between Participants' Socio-Demographic Characteristics and the Experimentation and Reaching Out to the Knowledge Base Sub-Dimensions of the Teacher Professional Learning Scale

Variables		**Experimentation**		**Reaching out to the knowledge base**	
		$\underline{X}$	**sd**	$\underline{X}$	**sd**
Branch	Science	4.25	0.47	4.11	0.47
	English	4.65	0.63	4.23	0.53
	Maths	4.13	0.62	3.89	0.68
	Classroom teaching	4.41	0.50	4.21	0.46
	Social studies	4.34	0.59	4.08	0.57
	Turkish	4.49	0.43	4.01	0.48
	Other	4.44	0.41	4.29	0.46
	Test value	1.592***		1.267***	
	p	0.155		0.277	
Gender	Male	4.42	0.48	4.12	0.45
	Female	4.39	0.53	4.14	0.54
	Test value	0.316**		-0.217	
	p	0.753		0.829	
Education level	Bachelor's degree	4.40	0.51	4.12	0.51
	Master's degree	4.37	0.49	4.26	0.53
	Test value	0.277 ***		-1.163 ***	
	p	0.782		0.247	
Duration of seniority in the profession	1-5	4.36	0.57	4.13	0.36
	6-10	4.51	0.44	4.22	0.49
	11-15	4.33	0.54	4.07	0.51
	16-20	4.49	0.49	4.13	0.59
	over 21	4.36	0.52	4.17	0.49
	Test value	0.672***		0.330***	
	p	0.613		0.852	
Total number of students in the school	500 and below	4.39	0.51	4.15	0.48
	500-1000	4.41	0.51	4.13	0.54
	Test value	-0.245**		0.282**	
	p	0.807		0.779	
Voluntary participation in professional training	Yes	4.43	0.50	4.19	0.49
	No	4.30	0.55	3.96	0.56
	Test value	1.223**		2.151**	
	p	0.224		**0.033***	

"*p<0.05. ** Independent t-test *** One-way analysis of variance"

According to Table 7, there are statistically significant differences between the participants' voluntary participation in professional training and their scores on the Reaching out to the knowledge base dimension of the Teacher Professional Learning Scale (p<.05). Accordingly, participants who voluntarily participated in professional development training had higher scores on the Reaching out to the knowledge base subscale than those who did not participate. No statistically significant differences were found among the other variables. The data obtained as a result of the analyses are illustrated in Table 8.

Table 8. The Comparison of the Total Scores on the Reflective Thinking Tendency Scale Based on Participants' Socio-demographic Characteristics

Variables		**Reflective Thinking Tendency Scale**			
		$\underline{X}$	SD	Test value	p
Branch	Science	4.24	0.71	1.534 ***	0.196
	English	4.35	0.56		
	Maths	4.30	0.54		
	Classroom teaching	4.34	0.54		
	Social studies	4.29	0.66		
	Turkish	4.35	0.61		
	Other	4.39	0.55		
Gender	Male	4.31	0.52	-0.356**	0.722
	Female	4.35	0.60		
Education level	Bachelor's degree	4.33	0.57	-478**	0.634
	Master's degree	4.39	0.50		
Duration of seniority in the profession	1-5	3.72	0.85	1.534***	0.196
	6-10	4.38	0.54		
	11-15	4.37	0.53		
	16-20	4.35	0.59		
	over 21	4.33	0.56		
Total number of students in the school	500 and below	4.15	0.70	-3.299**	**0.001***
	500-1000	4.47	0.40		
Voluntary participation in professional training	Yes	4.36	0.53	1.091**	0.277
	No	4.23	0.69		

"*p<0.05. ** Independent t-test *** One-way analysis of variance"

According to Table 8, there is a statistically significant difference in the total scores on the Reflective Thinking Tendency Scale based on the total number of students in the school. This difference favors participants working in schools with a student population between 500 and 1000. No statistically significant differences were found among the other variables. The data obtained as a result of the analyses are illustrated in Table 9.

Table 9. The Comparison of the Reflective Thinking Tendency Scale Sub Dimension Scores by the Socio-Demographic Characteristics of the Participants

Variables		**Continuous and purposeful thinking**		**Open-mindedness**		**Questioning and effective teaching**	
		$\underline{X}$	**sd**	$\underline{X}$	**sd**	$\underline{X}$	**sd**
Branch	Science	4.63	0.53	4.56	0.47	4.64	0.67
	English	4.72	0.39	4.69	0.43	4.58	0.49
	Maths	4.60	0.46	4.56	0.42	4.60	0.46
	Classroom teaching	4.64	0.67	4.56	0.58	4.68	0.46
	Social studies	4.58	0.49	4.48	0.40	4.63	0.53
	Turkish	4.68	0.46	4.66	0.52	4.72	0.39
	Other	4.74	0.46	4.71	0.48	4.74	0.46
	Test value	0.334***		0.495 ***		0.242***	
	p	0.918		0.811		0.962	
Gender	Male	3.99	0.70	4.57	0.54	4.60	0.59

	Female	4.14	0.73	4.64	0.47	4.70	0.48
	Test value	-1.098 **		-0.759 **		-0.990**	
	p	0.274		0.449		0.324	
Education level	Bachelor's degree	4.09	0.72	4.60	0.50	4.65	0.52
	Master's degree	4.13	0.74	4.69	0.45	4.76	0.47
	Test value	-0.217 **		-0.750 **		0.845**	
	p	0.828		0.455		0.399	
Duration of seniority in the profession	1-5	3.29	0.97	4.33	0.50	4.36	0.62
	6-10	4.29	0.60	4.58	0.49	4.74	0.46
	11-15	4.11	0.68	4.68	0.44	4.70	0.46
	16-20	4.07	0.79	4.68	0.40	4.69	0.46
	over 21	4.12	0.69	4.56	0.58	4.62	0.60
	Test value	1.935 ***		0.858 ***		0.646***	
	p	0.109		0.491		0.630	
Total number of students in the school	500 and below	3.84	0.92	4.54	0.52	4.61	0.57
	500-1000	4.28	0.43	4.67	0.47	4.70	0.47
	Test value	-3.322 **		-1.578 **		-0.992**	
	p	**0.001 ***		0.117		0.323	
Voluntary participation in professional training	Yes	4.12	0.67	4.64	0.47	4.70	0.51
	No	3.99	0.88	4.52	0.55	4.52	0.53
	Test value	0.922**		1.213**		1.726**	
	p	0.358		0.227		0.087	

"*p<0.05. ** Independent t-test, ***One-way analysis of variance"

Table 9 shows that there is a statistically significant difference in the "Continuous and Purposeful Thinking" subscale scores according to the total number of students in participants' schools (p<.05). Participants working in schools with a student population between 500 and 1000 scored higher on the "Continuous and Purposeful Thinking" subscale than those working in schools with 500 or fewer students. No statistically significant differences were found among the other variables. The data obtained as a result of the analyses are illustrated in Table 10.

Table 10. The Comparison of the Reflective Thinking Tendency Scale Sub-Dimension Scores by the Socio-Demographic Characteristics of the Participants

Variables		**Being an investigator**		**Being proactive and sincere**		**Career perspective**	
Branch	Science	4.20	0.87	4.09	0.79	4.14	1.03
	English	4.23	0.78	4.29	0.61	4.38	1.06
	Maths	4.19	0.72	4.25	0.60	4.39	1.10
	Classroom teaching	4.19	0.73	4.43	0.52	4.35	1.04
	Social studies	4.35	0.70	4.30	0.67	3.90	1.43
	Turkish	4.22	0.77	4.14	0.82	4.13	1.18
	Other	4.30	0.67	4.21	0.73	4.32	1.05
	Test value	0.115***		0.662***		0.364***	
	p	0.994		0.681		0.901	
Gender	Male	4.26	0.61	4.37	0.52	4.18	1.08
	Female	4.23	0.77	4.21	0.72	4.31	1.09
	Test value	0.239**		1.246**		-0.625**	
	p	0.812		0.215		0.533	
Education level	Bachelor's degree	4.23	0.74	4.25	0.67	4.27	1.11
	Master's degree	4.28	0.62	4.32	0.70	4.26	0.93
	Test value	-0.285 **		-0.369 **		0.009**	
	p	0.776		0.712		0.993	

Duration of seniority in the profession	1-5	4.67	0.52	3.65	1.24	3.80	1.64
	6-10	3.50	0.97	4.14	0.61	4.38	1.01
	11-15	4.26	0.76	4.30	0.66	4.26	1.05
	16-20	4.31	0.63	4.34	0.58	4.26	1.19
	over 21	4.29	0.73	4.30	0.66	4.29	1.04
	Test value	1.474 ***		1.348***		0.271***	
	p	0.214		0.256		0.896	
Total number of students in the school	500 and below	3.96	0.86	4.13	0.80	4.01	1.34
	500-1000	4.44	0.52	4.36	0.53	4.46	0.80
	Test value	-3.712 **		-1.894 **		-2.256**	
	p	**0.000***		0.061*		**0.027***	
Voluntary participation in professional training	Yes	4.28	0.70	4.25	0.64	4.30	1.07
	No	4.10	0.80	4.29	0.76	4.14	1.16
	Test value	1.167**		-0.272**		0.713**	
	p	0.246		0.786		0.477	

"*p<0.05, ** Independent t-test, *** One-way analysis of variance"

Table 10 shows that the scores for the Being an Investigator and Career Perspective subscales reveal statistically significant differences based on the total number of students in participants' schools (p<.05). Accordingly, participants working in schools with a student population between 500 and 1000 scored higher on the "Being an Investigator" and Career Perspective subscales than those working in schools with 500 or fewer students. No statistically significant differences were found among the other variables. The data obtained as a result of the analyses are illustrated in Table 11.

Table 11. The Results of the Mann–Whitney U Test Conducted to Compare the "Teaching Responsibility and Scientificness" Subscale Scores of the Reflective Thinking Tendency Scale

	Teaching Responsibility and Scientific Dimension					
Variables	**Group**	**N**	**Mean Ranks**	**Sum Ranks**	**U**	**p**
Gender	Male	42	63	2636	1733	0.437
	Female	90	68	6143		
Education level	Bachelor's degree	113	67	7538	1051	0.880
	Master's degree	19	65	1241		
Total number of students in the school	500 and below	57	61	3465	1812	0.130
	Between 500-1000	75	71	5314		
Voluntary participation in professional training	Yes	103	66	6806	1450	0.809
	No	29	68	1972		

"*p<0.05."

According to Table 11, a non-parametric Mann–Whitney U test was conducted to compare the Teaching Responsibility and Scientificness subscale of the Reflective Thinking Tendency Scale, which did not exhibit a normal distribution (see Table 2), with socio-demographic variables. Accordingly, no statistically significant differences were found between the Teaching Responsibility and Scientificness subscale scores and participants' gender, education level, total number of students in the school, and voluntary participation in professional training. The data obtained as a result of the analyses are illustrated in Table 12.

Table 12. The Results of the Kruskal–Wallis Test Conducted to Compare the "Teaching Responsibility and Scientificness" Subscale Scores of the Reflective Thinking Tendency Scale

Variables	**Teaching Responsibility and Scientific Dimension**					
	Gruoup	**N**	**Mean Ranks**	**sd**	**X^2**	**p**
Branch	Science	14	63	6	2.109	0.909
	English	13	66			
	Maths	14	58			
	Classroom teaching	34	68			
	Social studies	10	75			
	Turkish	19	73			
	Other	28	64			
Duration of seniority in the profession	1-5	5	40.70	4	2.544	0.564
	6-10	16	67.72			
	11-15	39	66.42			
	16-20	29	66.53			
	Over 21	43	69.09			

"*p<0.05."

According to Table 12, a non-parametric Kruskal–Wallis test was conducted to compare the Teaching Responsibility and Scientificness subscale of the Reflective Thinking Tendency Scale, which did not exhibit a normal distribution (see Table 2), with socio-demographic variables. Accordingly, no statistically significant differences were found between the Teaching Responsibility and Scientificness subscale scores and participants' seniority or fields of study. The data obtained as a result of the analyses are illustrated in Table 13.

Table 13. Pearson correlation analysis results demonstrating the relationships between "Teachers' Attitudes Towards Professional Development" and "Professional Learning" and "Reflective Thinking Tendencies"

Scale and Dimensions		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1.Attitude scale towards professional development	r	1.000	0.296*	0.246*	0.168	0.207	0.275*	0.027	0.221*	0.267*	-0.005	0.175*	0.146	0.015	0.132
	p	-	0.001	0.004	0.055	0.017	0.001	0.756	0.011	0.002	0.955	0.045	0.094	0.869	0.132
2.Collaboration	r		1.000	0.633	0.533	0.482	0.777	0.195*	0.241*	0.351*	0.122	0.252*	0.299*	0.173*	0.271*
	p		-	0.000	0.000	0.000	0.000	0.025	0.005	0.000	0.162	0.004	0.000	0.048	0.002
3.Reflection	r			1.000	0.673	0.656	0.918	0.297*	0.312*	0.438*	0.163	0.302*	0.305*	0.183*	0.341*
	p			-	0.000	0.000	0.000	0.001	0.000	0.000	0.062	0.000	0.000	0.035	0.000
4.Experimentation	r				1.000	0.667	0.829	0.265*	0.343*	0.432	0.157	0.272*	0.375*	0.136	0.333*
	p				-	0.000	0.000	0.002	0.000	0.000	0.072	0.002	0.000	0.120	0.000
5.Reaching out to the knowledge base	r					1.000	0.824	0.163	0.260*	0.401*	0.048	0.145	0.188*	0.095	0.209*
	p					-	0.000	0.062	0.003	0.000	0.582	0.098	0.031	0.276	0.016
6.Teacher professional learning	r						1.000	0.280*	0.342*	0.483*	0.149	0.294*	0.342*	0.179*	0.346*
	p						-	0.001	0.000	0.000	0.088	0.001	0.000	0.040	0.000
7.Continuous and purposeful thinking	r							1.000	0.452	0.293	0.795	0.770	0.696	0.695*	0.874*
	p							-	0.000	0.001	0.000	0.000	0.000	0.000	0.000
8.Open-mindedness	r								1.000	0.791	0.441	0.532	0.482	0.473	0.695
	p								-	0.000	0.000	0.000	0.000	0.000	0.000
9.Questioning and effective teaching	r									1.000	0.282	0.443	0.387	0.373	0.572*
	p									-	0.001	0.000	0.000	0.000	0.000
10.Teaching responsibility and scientificness	r										1.000	0.852	0.747	0.725	0.893*
	p										-	0.000	0.000	0.000	0.000
11.Being an investigator	r											1.000	0.777	0.738	0.925*
	p											-	0.000	0.000	0.000
12.Being proactive and sincere	r												1.000	0.598	0.834*
	p												-	0.000	0.000
13. Career perspective	r													1.000	0.807*
	p													-	0.000
14. RTTS	r														1.000
	p														-

"*p<0,005;"

Table 13 shows that there are significant positive differences between teachers' attitudes toward professional development and their levels of professional learning and reflective thinking tendencies. These differences were also identified in the sub-dimensions.

DISCUSSION AND CONCLUSION

This study aims to examine the relationship between secondary school teachers' attitudes toward professional development and their tendencies toward professional learning and reflective thinking across different subject areas. The results revealed that teachers' attitudes toward professional development were at a moderate level and that variables such as subject area, gender, educational level, years of professional experience, number of students in the school, and voluntary participation in professional development programs did not have a significant effect on these attitudes. Altun and Yengin-Sarpkaya (2021) state that teachers tend to adopt an outcome-oriented approach in their professional development processes, may encounter challenges related to locally organized in-service training, and often focus primarily on the practical execution of their profession. However, professional development is a long-term and continuous process that unfolds over the course of many years. Aydemir and Uslu (2023) associate professional development with lifelong learning and emphasize that teachers should possess a high level of motivation for continuous learning throughout their careers. Çavuş et al. (2024) attribute the factors hindering professional development to a range of administrative challenges. They identify the primary obstacles in the professional development process as economic constraints; difficulties in meeting the educational demands of a constantly changing and evolving era; challenges in adapting to new systems and skills; negative societal perceptions of the teaching profession; and deficiencies in undergraduate education and ministry-led initiatives. Hürsen (2012) state that female teachers' attitudes toward professional development were more positive than those of male teachers, Yalçın İncik and Akbay (2018) emphasized that gender, seniority, the school from which teachers graduated, and participation in professional development activities had no effect on teachers' professional development. On the other hand, Eroğlu (2019) state that female teachers participated in reflective activities more than male teachers. Eroğlu (2019) also state that single teachers participate in updating activities more than married teachers, teachers with the lowest professional seniority (1-5 years) participate in sharing activities more frequently than all other groups, and art/sports teachers participate the least in collaboration activities.

In the current study, teachers' professional learning levels were found to be high. It was determined that teachers' professional learning levels were not significantly influenced by their field of study, gender, educational background, or years of professional experience. On the other hand, significant differences were found in teachers' professional learning levels based on the total number of students in the school (Collaboration subscale) and their voluntary participation in professional development training (Collaboration and Reaching out to the knowledge base subscales). These differences favored teachers working in schools with a

student population between 500 and 1000, as well as those who voluntarily participated in professional development training. Similar findings have been reported in the literature, indicating that classroom teachers' professional learning levels do not significantly differ by gender or educational background (Karasu et al., 2023). Professional learning has been associated with factors such as the availability of professional development opportunities, willingness and openness to learn, professional satisfaction, and high levels of motivation (Gemeda & Tynjälä, 2015). Bahous et al. (2016) conceptualize teachers' professional learning as encompassing both formal, structured programs and informal processes, such as reflecting on teaching practices and on what has been learned. In this regard, the absence of a clear and compelling vision for teachers in public schools remains one of the major obstacles to school improvement efforts (Robertson, 2011). Başol (2024) states that teachers require professional learning activities in areas such as technology integration, classroom management, instructional methods and techniques, and the use of teaching materials and resources.

The teachers' reflective thinking tendencies were found to be high, and the primary factor influencing this tendency was identified as the total number of students in the school. According to the total number of students in participants' schools, significant differences were observed in the subscale scores for Continuous and Purposeful Thinking, Being an Investigator, and Career Perspective. Participants working in schools with a student population between 500 and 1000 scored higher on the scale compared to those in schools with 500 or fewer students. Accordingly, teachers working in schools with a larger student population appear to utilize reflective thinking skills more effectively than those working in schools with fewer students. On the other hand, variables such as subject area, gender, educational background, professional seniority, and voluntary participation in professional training were not found to significantly affect teachers' reflective thinking tendencies. This outcome may be attributed to the fact that teachers in more crowded schools are likely to encounter a greater number of challenges involving students, parents, colleagues, and administrators. Indeed, in order for a teacher to engage in reflection, they must first encounter a problem and then generate alternative solutions (Dewey, 1933; Rodgers, 2002). Chen and Seng (1992) noted that individuals with greater subject knowledge, skills, or professional experience tend to develop reflective thinking skills more rapidly. Relevant literature suggests that gender has an influence on reflective thinking tendencies, with female teachers reported to use reflective thinking skills more frequently than their male counterparts (Berkant & Mansuroğlu, 2023). In addition, STEM education has been reported to foster the development of reflective thinking among preschool teachers (Samur & Altun-Yalçın, 2021). Çarkıt and İplik (2021) indicate that Turkish teachers view reflective thinking skills as essential for students, particularly in terms of knowledge transfer, self-awareness, and evaluative abilities. In another study, preschool teachers' reflective thinking tendencies were found to be relatively high and were reported to vary significantly based on age, gender, and professional seniority (Balibay, 2024).

Another key finding of this study is the existence of significant and positive relationships between teachers' attitudes toward professional development and their professional learning and reflective thinking tendencies. According to this finding, establishing collaboration, transferring learned knowledge to both similar and novel situations, and

accessing relevant information are considered to have a positive impact on professional development. In addition, factors such as professional self-perception, continuous and purposeful thinking, open-mindedness and critical inquiry, effective teaching practices, and forward-thinking attitudes contribute to professional development. Studies on this subject have revealed significant relationships between teachers' attitudes toward their profession and reflective thinking tendencies (Kozikoğlu & Gönülal, 2020; Yumuşak, 2015). This finding clearly indicates that collective measures implemented in schools can lead to positive outcomes from both individual and societal perspectives. One of the strongest indicators of this alignment is student achievement. Indeed, one of the most effective ways to observe a teacher's professional development is through students' positive behaviors and academic performance (Darling-Hammond & Snyder, 2000; Heafner, 2019).

The results indicate that teachers' attitudes toward professional development are moderate, while their levels of professional learning and reflective thinking tendencies are high. It can be said that the total number of students in the school and voluntary participation in professional development training have an effect on teachers' levels of professional learning. The main factors affecting teachers' reflective thinking tendencies were found to be variables such as gender, educational background, professional seniority, and voluntary participation in professional training. Significant and positive relationships were found between teachers' attitudes toward professional development and their professional learning and reflective thinking tendencies.

Recommendations

- ✓ The study did not reach a sufficient number of participants from each branch group. In this context, it may be recommended that researchers undertake studies covering all branch levels.
- ✓ The study found that voluntary participation had positive effects on cooperation and access to information. Therefore, it may be recommended that teachers participate in professional development programs, prioritizing their personal motivation.
- ✓ Regular sharing of information and experiences with colleagues within the school or on online platforms can increase both collaboration skills and professional satisfaction among teachers. Sharing meetings within schools or between schools can be organized to benefit from the experiences of teachers working with larger student groups.

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