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Research Article

A reliability and validity study of professional development models tendency scale

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The aim of this study is to develop a valid and reliable measurement tool to identify teachers' tendencies towards professional development models. In line with the purpose of scale development, a survey model was preferred. The scale was designed to be applicable to teachers from various disciplines currently working in any institution (preschool, primary, secondary, and high school levels). The study sample comprises teachers working in public schools from various districts. During the scale development process, Exploratory Factor Analysis (EFA) was initially conducted, followed by Confirmatory Factor Analysis (CFA). EFA was performed with data from 408 participants, while CFA was conducted with data from 260 participants. As a result of the analyses, a scale consisting of 4 factors and 31 items was obtained. The sub-factors of the scale were named as "Tendency towards observation-based professional activities, Belief in collaboration with colleagues, Participation in collaborative activities, and Resistance to observation and supervision." The Cronbach's Alpha reliability coefficient of the scale was determined to be 0.94. The relationships between the scale factors were examined by calculating Pearson correlation coefficients. Moderate to high positive and significant correlations were found between the total score obtained from the scale and its factors. The findings revealed that the scale demonstrated a satisfactory level of internal consistency, indicating its validity and reliability. Accordingly, the scale was designated as the "Professional Development Models Tendency Scale."

Keywords: Professional development scale; Teachers' professional development; Professional development models

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1. Introduction

Education is a dynamic process, continuously evolving, with the responsibilities of teachers becoming increasingly multifaceted. In recent years, significant shifts have taken place in educational environments, largely due to technological advancements and globalization. For teachers to keep pace with these changes, active participation in professional development processes and ongoing learning are crucial. Professional development of teachers plays a critical role in enhancing the quality of education (Eroğlu & Özbek, 2020; Gülşen&Yörük, 2021; Ingersoll & Strong, 2011; İlğan, 2021; Wei et al., 2009). This process is instrumental in enhancing teachers' competencies and advancing the overall quality of education. Research underscores that effective professional development not only facilitates individual teacher growth but also positively impacts

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students' learning experiences (İlğan, 2021; Korukluoğlu, 2023). Initiatives such as training sessions, workshops, and collaborative activities not only enhance teachers' pedagogical knowledge and skills but also promote a culture of cooperation and unity within educational communities (Wei et al., 2009).

However, teachers face several challenges in their professional development processes. Insufficient resources, time, and supportive environments within educational systems can hinder participation in these processes. Additionally, the quality of professional development programs often falls short. Programs that fail to address teachers' actual needs lead to decreased participation and interest (Guskey, 2002). These shortcomings limit the effectiveness of professional development efforts. Dissatisfaction among teachers is often linked to the inability of these programs to cater to their diverse needs. İnan and Lowther (2010) and Darling-Hammond (2017) highlight that this dissatisfaction stems from standardized, non-individualized approaches that do not align with teachers. This lack of personalization diminishes participation and weakens the impact of professional development. Moreover, as Desimone (2009) points out, short-term and inadequate programs are common, hindering teacher learning and sustainability. Effective professional development requires long-term engagement and continuous support. However, traditional models often encourage passive learning, diminishing teacher interest and making it difficult to implement new knowledge and skills in the classroom. Furthermore, these activities place additional time pressures on already heavy workloads, complicating the integration of new practices into classroom settings. Hirsh (2009) suggests that time constraints reduce the overall effectiveness of professional development by fostering superficial participation.

Given these challenges, there is a growing need for different professional development models that emphasize teachers' specific needs. There are various models designed to support professional development in education. Among these, the Sparks and Loucks-Horsley Model, Mackenzie's Professional Development Model, school-based professional development, action research, mentoring, professional learning communities, continuous professional development [CPD] models, and online professional development models are commonly cited (Guskey, 2002; İlğan, 2021; Ling & MacKenzie, 2001; Priadi et al., 2023; Scott, 2018; Sparks & Loucks-Horsley, 1989). Building upon the professional development models in the literature, this study specifically focuses on collaborative professional development models, which are particularly significant in fostering sustainable and practice-oriented teacher learning. Research indicates that professional development initiatives emphasizing collaboration lead to deeper engagement, reflective practice, and long-term instructional improvement (Darling-Hammond et al., 2017; Desimone, 2009). These models are further categorized into two subtypes: "observation-based models and collegial collaboration models". Collaborative professional development models refer to professional development practices where teachers actively engage in shared learning experiences, exchange expertise, and support one another's professional growth in a collaborative environment. These models are often implemented in the form of professional learning communities [PLCs] or collaborative learning groups, fostering collective efficacy and sustained professional growth (Vescio et al., 2008). The rationale for emphasizing collaborative models lies in their capacity to create meaningful, context-responsive learning opportunities that move beyond isolated training sessions. By integrating collaboration into professional learning, teachers are more likely to internalize and apply new knowledge, leading to improved student outcomes (Borko, 2004; Opfer & Pedder, 2011). Observation and collegial collaboration models are particularly noteworthy in this regard. Observation-based professional development models allow teachers to enhance their skills by analyzing and reflecting on classroom practices (Avalos, 2011). In this model, teachers observe each other's lessons and provide feedback, fostering both individual and collective learning (Opfer & Pedder, 2011). Collaboration among colleagues encourages teachers to develop innovative pedagogical strategies by learning from one another. Such collaboration fosters professional learning communities where teachers work together to solve educational challenges (Hargreaves & Fullan, 2012). Collegial collaboration model, in particular, takes place in a

supportive environment, where teachers share their experiences and knowledge, strengthening professional solidarity (Hargreaves & Fullan, 2012). These models not only support continuous teacher development but also improve teaching quality.

As the demands and expectations in education continue to evolve, teachers' need for effective professional development models becomes even more critical. High-quality professional development programs enable teachers to assess and enhance their practices through lesson observations and feedback (Darling-Hammond et al., 2017). These models not only allow teachers to refresh their existing knowledge but also to adopt new pedagogical approaches. Consequently, these programs are vital in supporting teachers' ongoing professional development to enhance both teaching quality and student academic performance (Wei et al., 2009). Educational institutions should therefore create more supportive frameworks for teacher development, ensuring inclusivity in these processes (Wei et al., 2009). By doing so, teachers can adapt to changing educational dynamics and boost student success (Ingersoll & Strong, 2011).

In this context, determining teachers' tendencies towards professional development models is essential for designing more effective strategies in education (Richards, 2011). Identifying which types of professional development opportunities are most appealing to teachers and which strategies are most effective can contribute to improve educational policies and programs (Guskey & Bailey, 2010). Thus, developing a valid and reliable measurement tool to identify teachers' tendencies towards professional development models is crucial (Tschannen-Moran & McMaster, 2009). Such a tool can evaluate teachers' needs and expectations and measure the effectiveness of their current professional development efforts. Additionally, it can highlight areas where teachers' professional growth needs reinforcement (Feiman-Nemser, 2001). By utilizing such a tool, educational institutions can gain deeper insights into teachers' professional development processes and devise effective strategies (Desimone, 2009). This makes it possible to design customised training programmes for teachers and to better direct the resources teachers need to improve themselves.

As the process of developing a Professional Development Models Tendency Scale for Teachers is a foundational step towards identifying and addressing teachers' needs, designing effective programs, and fostering greater participation; so the efforts are essential in ensuring the success of professional development initiatives and improving overall educational outcomes (Börkan et al., 2022; Korukluoğlu, 2023). However, despite the critical role of professional development models in enhancing teaching practices and educational quality, there is currently no existing scale specifically designed to measure teachers' tendencies towards these models. The absence of such a scale creates a significant gap in assessing teachers' preferences, engagement levels, and perceived effectiveness of different professional development approaches. Therefore, developing a Professional Development Models Tendency Scale is essential to fill this gap, provide a reliable and valid measurement tool, and contribute to the design of evidence-based professional development programs tailored to teachers' needs.

As a result, the purpose of this study is to develop a valid and reliable measurement tool to identify teachers' tendencies towards professional development models. This tool aims to provide a deeper understanding of teachers' needs and expectations, evaluate the effectiveness of their professional development, and inform strategies to enhance these processes. Through such measures, educational institutions can better support teacher development and improve the overall quality of the education system.

2. Method

2.1. Research Model

This study aims to develop a scale to identify teachers' tendencies toward professional development models using a descriptive survey model. The primary purpose of this model is to describe and analyze a specific situation or event as it exists. Although descriptive survey studies mainly focus on quantitative data, they may also include qualitative data (Cohen et al., 2011).

2.2. Research Group

The study sample consisted of teachers working in public schools in Balıkesir province during the 2022–2023 academic year. Data collection was carried out over a two-month period, targeting teachers from a total of 20 districts across the province. Initially, Balıkesir's districts were considered as clusters, while school types within these clusters—kindergarten, primary, secondary, and high schools—were treated as stratified subgroups. To ensure proportional representation of these subgroups within the population, stratified sampling was employed. Since the primary goal was to maximize participation rather than obtain a specific number of participants from each subgroup, disproportionate stratified random sampling was utilized. In this technique, the population is divided into specific subgroups (strata), and different numbers of random samples are drawn from each stratum based on research needs or predetermined criteria rather than the size of each stratum (Kumar, 2019).

According to scale development guidelines, the sample size for Exploratory Factor Analysis (EFA) should be 5 to 10 times the number of items. For Confirmatory Factor Analysis (CFA), a sample size of 300 is considered "good," 500 is deemed "very good," and 1,000 is regarded as "excellent" (Tezbaşaran, 2008; Field, 2013; Brown, 2015; DeVellis, 2017). In line with these recommendations, data were collected from 408 participants for EFA and 260 different participants for CFA. Tables 1 and 2 present detailed information about the participants included in the EFA and CFA samples.

Table 1
Distribution of participants by gender, educational level, and type of institution they work at for EFA

Variable	*f*	*%*
Gender		
Female	261	64
Male	147	36
Educational level		
Bachelor's degree	368	90.2
Master's degree	40	9.8
Type of institution		
Kindergarten	38	9.3
Primary school	101	24.75
Secondary school	152	37.25
High School	100	24.5
Other Institutions*	17	4.1

Note. Other institutions include universities, special Education schools, practice schools, other institutions affiliated with the Ministry of National Education, public education centers.

As shown in Table 1, 64% of the EFA participants are female, while 36% are male. Additionally, 90.2% of the participants hold a bachelor's degree. The majority of participants work at the primary school (24.75%) and secondary school (37.25%) levels.

As shown in Table 2, the majority of the CFA participants are female teachers (66.54%), while male teachers make up 33.46% of the sample. Regarding educational background, most teachers have a bachelor's degree (77.69%), followed by those with a master's degree (20.77%) and a small percentage with a Ph.D. (1.54%). In terms of institution types, the largest group consists of high school teachers (40.00%), followed by secondary school teachers (30.38%), primary school teachers (20.00%), and kindergarten teachers (7.69%). A small fraction (1.92%) is categorized under "other."

Table 2
Distribution of participants by gender, educational level, and type of institution they work at for CFA

Variable	*f*	*%*
Gender		
Female	183	66.54
Male	87	33.46
Educational level		
Bachelor's degree	202	77.69
Master's degree	43	20.77
PhD	4	1.54
Type of institution		
Kindergarten	20	7.69
Primary school	52	20
Secondary school	79	30.38
High School	104	40
Other Institutions*	5	1.93

2.3. Development of the Scale

The objective of this study was to develop a valid and reliable measurement tool to identify teachers' tendencies toward professional development models. The scale development process involved several key steps, including creating an item pool, gathering expert feedback, conducting a pre-application trial, and assessing the scale's properties (Anderson, 1988; Özdamar, 2017). A two-stage approach was adopted to generate the item pool: items were drawn both from existing literature and from interviews conducted with teachers. Initially, a literature review was conducted, analyzing theses and articles on professional development (Bümen et al., 2012; Guskey, 2000; İlğan, 2013; Sparks & Loucks-Horsley, 1989; Uştu et al., 2016). In parallel, a draft interview form was created to guide face-to-face interviews with 20 teachers to gather additional data for item generation. Content analysis was employed to analyze the interview data, which were then synthesized to develop the scale items.

The Professional Development Models Tendency Scale was developed as a five-point Likert-type scale. An initial pool of 190 items was generated and reviewed by the researchers. Items that were deemed irrelevant to the study's purpose were eliminated, resulting in a refined set of 46 items. These remaining items were then presented to a panel of experts, including three field experts and two language experts. Based on their feedback, necessary adjustments were made to ensure both linguistic and content validity. After these revisions, the number of items was increased to 53, as experts suggested additional items.

Next, the scale was organized digitally, and the items were randomly distributed to prevent predictable groupings of items with positive and negative loadings. A trial version of the scale was administered to a group of 15 teachers (not included in the main study) to assess its clarity, ease of use, and overall comprehensibility. The pilot study aimed to evaluate the clarity of the statements and ensure that they were easily understood by the participants. Based on the feedback received, ambiguous items or those not aligned with the intended objectives were revised and refined. Following the trial and further revisions, the final version of the scale, consisting of 53 items, was ready for administration. The scale was then applied to participants for Exploratory Factor Analysis (EFA).

3. Findings

3.1. Exploratory Factor Analysis (EFA)

Before conducting Exploratory Factor Analysis (EFA) to explore the factor structure of the Professional Development Models Tendency Scale (PDMTS), steps were taken to ensure that the data met the assumptions of normality and that the sample size was adequate for factor analysis. A

total of 433 teachers participated in the validity and reliability study of the PDMTS. Descriptive analyses were performed on the data, followed by statistical calculations. Initially, Z values were calculated to identify outliers that could potentially distort the normal distribution. This analysis revealed 25 outliers, which were excluded from the dataset due to their failure to complete all scale items, a factor that could adversely affect the normality of the distribution. As a result, a total of 408 participants remained for subsequent validity and reliability analyses. The appropriateness of the data for factor analysis was assessed by calculating the Kaiser-Meyer-Olkin (KMO) coefficient and conducting Bartlett's Test of Sphericity. The KMO value ranges from 0 to 1, with higher values indicating that the data is more suitable for factor analysis. The KMO value is interpreted as follows (Field, 2013): a value of 0.90 and above is considered excellent, 0.80 to 0.90 is good, 0.70 to 0.80 is moderate, 0.60 to 0.70 is weak, and a value less than 0.50 is considered poor.

Bartlett's Test of Sphericity was conducted to assess whether the correlations between the variables were statistically significant. A significant result ($p < .05$) indicates a meaningful relationship among the variables, thus justifying the use of factor analysis (Field, 2013). The results of the KMO coefficient and Bartlett's Test of Sphericity are presented in Table 3.

Table 3
KMO coefficient and Bartlett's sphericity test results

KMO.		.937
Bartlett test of sphericity	*Chi-square*	7701.746
	df	528
	p	.000

Upon examining Table 3, it is evident that the KMO coefficient is 0.937, indicating that the dataset is highly suitable for factor analysis. The Bartlett's Test of Sphericity results show a significant relationship between the variables (Chi-square = 7701.746; df = 528; $p < .001$), confirming the appropriateness of the data for factor analysis.

Principal Component Analysis (PCA) was performed with a factor loading cut-off of 0.30. Items with loadings greater than or equal to 0.30 were considered significant contributors to the variance explained by their respective factors (Kaiser, 1974). The analysis revealed five factors with eigenvalues greater than one. However, because the eigenvalues of factors beyond the fifth were very close, the solution was reduced to a four-factor model, and the analysis was re-run. To improve factor interpretation clarity, Varimax rotation was applied. During this process, several items (1, 2, 3, 4, 12, 13, 19, 25, 26, 32, 33, 34, 35, 38, 42, 45, 46, 51, 52, 53) were identified as having low factor loadings and were excluded from the analysis.

After several iterations of factor analysis, the final solution included 31 items grouped into four factors. Items from the fifth factor, which consisted of only two items (items 39 and 43) and had a low alpha reliability coefficient ($\alpha = 0.41$), were also removed based on expert feedback. The final factor structure is presented in Figure 1, and the distribution of items across factors is detailed in Table 4.

According to the factor analysis results, 13 items were grouped under the first factor, 6 items under the second factor, 7 items under the third factor, and 5 items under the fourth factor. The factors were named based on a comprehensive evaluation of both the common features of the items within each factor and their alignment with professional development models referenced in the literature and the introduction section of the study. Specifically, the naming of each factor was informed by the general thematic characteristics of the items it contained, as well as their relevance to established frameworks for professional development. The first factor was labeled "Tendency towards observation-based professional activities" due to its focus on behaviors and attitudes related to engaging in professional activities involving observation. The second factor, "Belief in collaboration with colleagues," was named to reflect the strong emphasis on cooperative approaches and teamwork. The third factor, "Participation in collaborative activities," captured the

Figure 1
Final eigenvalue factor plot

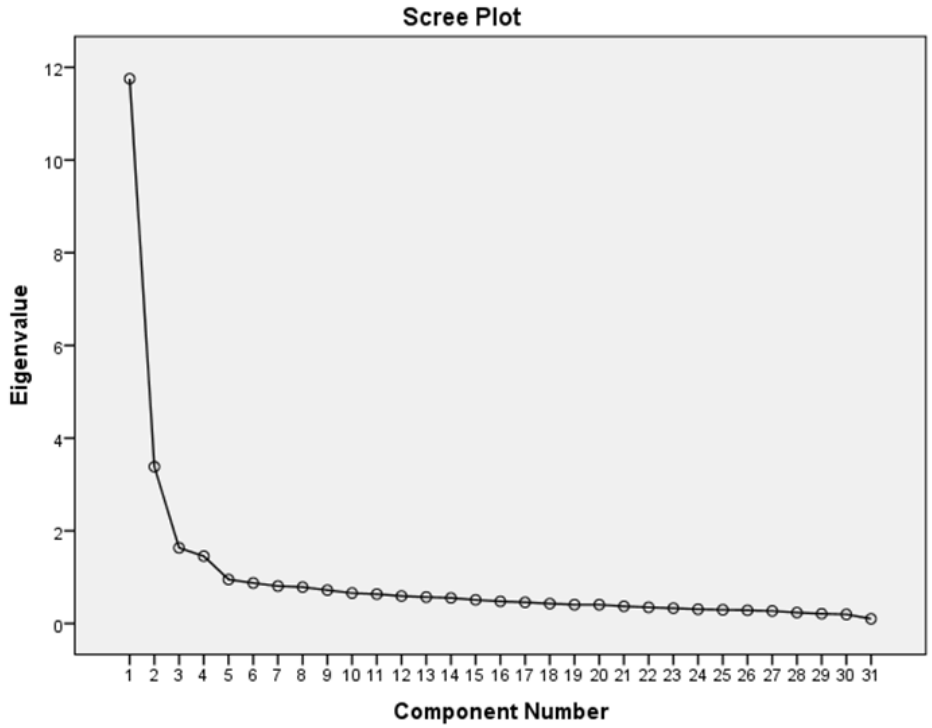


Table 4
Results of exploratory factor analysis of the professional development models tendency scale

Factors	*Factor Common Variance*	*Varimax Factor Loadings*	*Self-value*	*Variance Explained (%)*
1st Factor			11.75	37.91
Item 47	0.76	0.84		
Item 44	0.72	0.80		
Item 41	0.73	0.77		
Item 50	0.66	0.77		
Item 17*	0.61	0.74		
Item 14*	0.63	0.72		
Item 24	0.63	0.72		
Item 5	0.61	0.70		
Item 40	0.44	0.63		
Item 9	0.62	0.58		
Item 8	0.58	0.58		
Item 22	0.51	0.53		
Item 29	0.49	0.52		
2nd Factor			3.38	10.91
Item 16	0.70	0.76		
Item 18	0.65	0.73		
Item 7	0.64	0.71		
Item 15	0.63	0.67		
Item 10	0.65	0.65		
Item 11	0.48	0.62		

Table 4 continued

Factors	*Factor Common Variance*	*Varimax Factor Loadings*	*Self-value*	*Variance Explained (%)*
3rd Factor			1.63	5.27
Item 49	0.61	0.74		
Item 37	0.61	0.74		
Item 36	0.54	0.73		
Item 30	0.63	0.70		
Item 27	0.53	0.70		
Item 31	0.46	0.64		
Item 21	0.58	0.60		
4th Factor			1.45	4.69
Item 20*	0.52	0.70		
Item 28	0.52	0.67		
Item 23*	0.43	0.65		
Item 6	0.51	0.59		
Item 48	0.58	0.59		
		Total variance (%)		58.78

Note. *: Reverse items.

active involvement in collaborative endeavors, while the fourth factor, "Resistance to observation and supervision," was designated based on its representation of reluctance or resistance towards observation and supervision within professional contexts. These names were thus derived from both the thematic content of the items and their correspondence with the theoretical foundations outlined in the study.

The eigenvalue of the first factor is 11.75, accounting for 37.91% of the variance. The eigenvalue of the second factor is 3.38, explaining 10.91% of the variance. The eigenvalue of the third factor is 1.63, with 5.27% of the variance explained, and the eigenvalue of the fourth factor is 1.45, explaining 4.69% of the variance. The factor loadings of the items in the first factor ranged from 0.52 to 0.84, while the factor loadings in the second factor ranged from 0.62 to 0.76. The factor loadings for the third factor ranged from 0.60 to 0.74, and for the fourth factor, they ranged from 0.59 to 0.70. The total variance explained by the four factors is 58.78%. This explanation of more than half of the total variance suggests a high representativeness of the items in the scale.

3.2. Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was applied to determine the level of compatibility of the scale structure discovered through exploratory factor analysis with the available data. In the model, covariance was added between the items based on theoretical considerations and previous research, which indicated potential relationships between certain items. Furthermore, expert opinion was sought to ensure that these covariances were theoretically justifiable and aligned with established frameworks in the field. This step was taken to improve model fit and reflect the interrelated nature of the scale items. CFA is a statistical technique used to confirm or reject a previously specified theoretical model. This analysis provides the opportunity to test and develop theoretical models, evaluate the accuracy of measurements, and understand complex relationships (Çokluk, Şekercioğlu, & Büyüköztürk, 2012). Thanks to CFA, it was determined how well the existing data fit the four-factor structure. Analysis was performed using the Maximum Likelihood Estimation (MLE) technique. This technique is a common method of making parameter estimates in statistics and is used to determine how a model's parameters best fit observed data. The basic principle of the technique is to choose parameter values that maximize the probability of the observed data occurring. The use of this technique in CFA plays a critical role in estimating model parameters (Yurt, 2023). To assess the data fit of the four-factor model, goodness of fit measures were calculated and evaluated. Goodness of fit values are presented in Table 5.

Table 5
Fit values of the four-factor structure of the professional development models tendency scale

Criterion	*Good Fit*	*Acceptable Fit*	*Values Obtained*	*Source*
(χ^2/df)	≤ 3	≤ 4-5	2.55	Byrne, 1989
RMSEA	≤ 0.05	0.06-0.08	0.07	Browne ve Cudeck, 1993
SRMR	≤ 0.05	0.06-0.08	0.06	
GFI	≥ 0.90	0.85-0.90	0.89	Jöreskog and Sörbom, 1984
AGFI	≥ 0.90	0.80-0.90	0.86	
CFI	≥ 0.95	0.90-0.94	0.93	Bollen, 1989
TLI	≥ 0.95	0.90-0.94	0.93	
IFI	≥ 0.95	0.90-0.94	0.93	

When reviewing Table 5, it can be seen that the four-factor structure of the Professional Development Models Tendency Scale provides a generally acceptable fit with the research data. The four-factor structure of the scale was confirmed by the data, indicating that it accurately represents the underlying dimensions. The model tested through confirmatory factor analysis is shown in Figure 2. The path coefficients and their significance levels, obtained as a result of the factor analysis, are provided in Table 6.

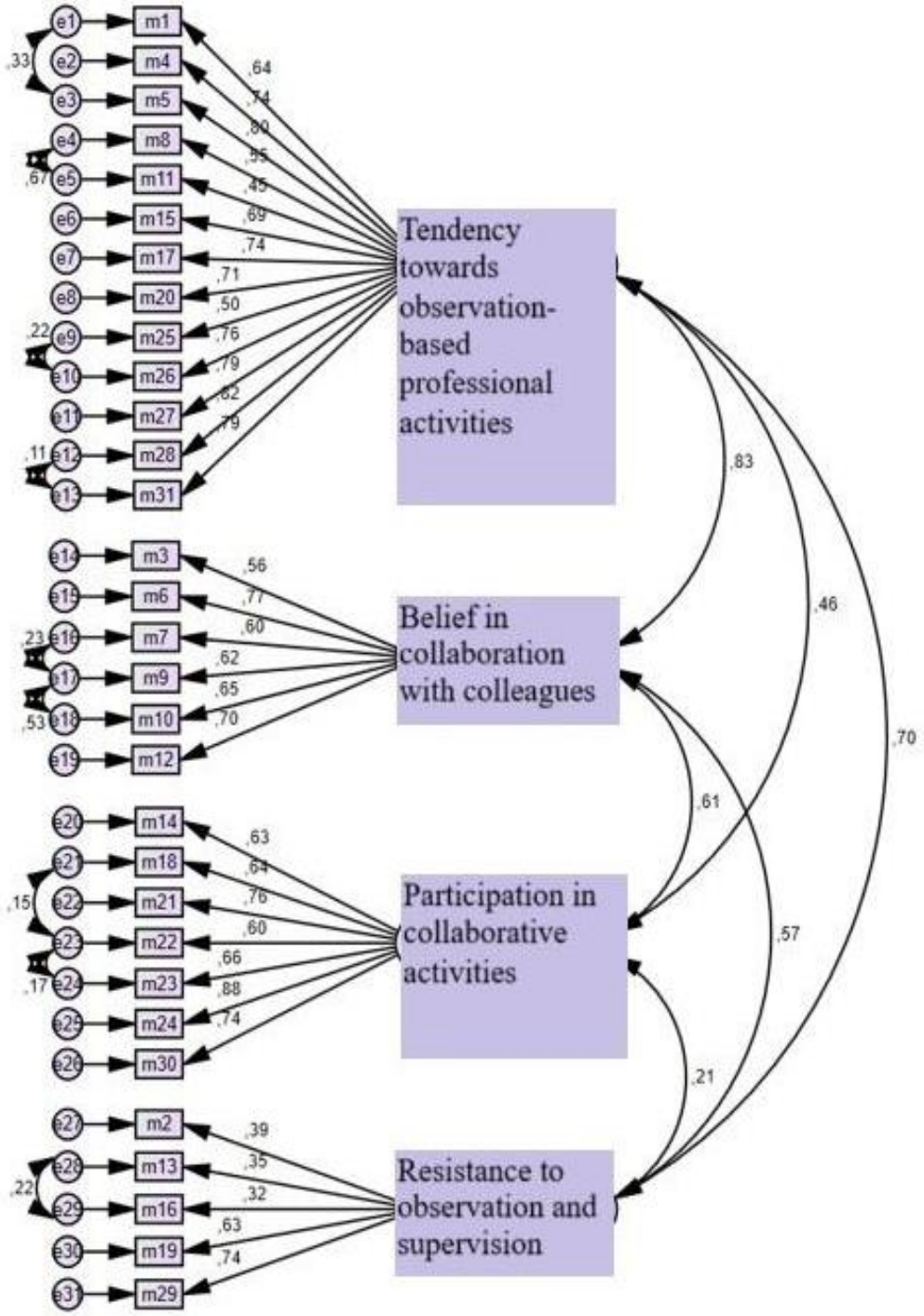
Table 6
Factor loadings and significance levels as a result of confirmatory factor analysis.

Factor		*Item*	*Factor loading (β)*	*B*	*Sh*	*t*	*p*
Factor 1	→	m1	0.64	1			
Factor 1	→	m4	0.74	1.01	0.09	10.86	***
Factor 1	→	m5	0.80	1.07	0.08	13.82	***
Factor 1	→	m8	0.55	0.97	0.11	8.49	***
Factor 1	→	m11	0.45	0.72	0.10	7.06	***
Factor 1	→	m15	0.69	1.00	0.10	10.21	***
Factor 1	→	m17	0.75	1.03	0.10	10.91	***
Factor 1	→	m20	0.71	0.90	0.09	10.56	***
Factor 1	→	m25	0.51	0.92	0.12	7.86	***
Factor 1	→	m26	0.77	1.06	0.10	11.09	***
Factor 1	→	m27	0.79	1.13	0.10	11.43	***
Factor 1	→	m28	0.82	1.19	0.10	11.77	***
Factor 1	→	m31	0.79	1.14	0.10	11.41	***
Factor 2	→	m3	0.56	1			
Factor 2	→	m6	0.77	1.42	0.15	9.30	***
Factor 2	→	m7	0.60	1.13	0.14	7.94	***
Factor 2	→	m9	0.63	0.97	0.12	8.15	***
Factor 2	→	m10	0.65	0.91	0.11	8.36	***
Factor 2	→	m12	0.70	1.18	0.13	8.78	***
Factor 3	→	m14	0.63	1			
Factor 3	→	m18	0.64	1.12	0.12	9.39	***
Factor 3	→	m21	0.76	0.99	0.09	10.65	***
Factor 3	→	m22	0.60	1.18	0.13	8.87	***
Factor 3	→	m23	0.66	1.06	0.11	9.57	***
Factor 3	→	m24	0.88	1.24	0.11	11.77	***
Factor 3	→	m30	0.74	1.08	0.10	10.51	***
Factor 4	→	m2	0.39	1			
Factor 4	→	m13	0.35	1.17	0.28	4.11	***
Factor 4	→	m16	0.32	1.04	0.27	3.91	***
Factor 4	→	m19	0.63	1.88	0.34	5.46	***
Factor 4	→	m29	0.74	2.10	0.37	5.65	***

Note. ***$p < .001$.

It was determined from the Table 6 that the factor loadings of the items in the Professional Development Models Tendency Scale ranged between 0.32 and 0.88 as a result of the confirmatory factor analysis. Additionally, each of the path coefficients was found to be statistically significant at the .001 level. Consequently, the four-factor structure of the Professional Development Models Tendency Scale, identified through exploratory factor analysis, was confirmed through confirmatory factor analysis.

Figure 2
Confirmatory Factor Analysis Diagram



Note. Chi-square=1054.11; df=413; $p < .001$.

3.3. Findings Related to Reliability Study

To determine the reliability of the Professional Development Models Tendency Scale, Cronbach's alpha coefficient was calculated. This coefficient ranges from 0 to 1, with values between 0.60 and 0.80 indicating a high level of reliability, and values from 0.80 to 1 suggesting an excellent level of reliability (Özdamar, 2004). Additionally, the relationships between scale factors were examined by calculating Pearson correlation coefficients. Alpha reliability coefficients were calculated and interpreted using the SPSS 28.0 statistical package program. The alpha reliability coefficients for the Professional Development Models Tendency Scale are presented in Table 7.

Table 7
Alpha reliability coefficients of the professional development models tendency scale.

Factor	*Number of items*	*Cronbach alfa*
Factor 1	13	0.88
Factor 2	6	0.88
Factor 3	7	0.81
Factor 4	4	0.72
Overall scale	31	0.94

An analysis of Table 7 indicates that the alpha coefficients for Factors 1, 2, 3, and 4 are 0.88, 0.88, 0.81, and 0.72, respectively. The overall scale's (see Appendix) alpha coefficient stands at 0.94. The calculated values showed that the scale was quite reliable and its reliability based on internal consistency was at a sufficient level.

3.4. Correlation Values between Sub-Factors and the Whole Scale

Pearson correlation coefficients were calculated to explore the relationships among the scale factors. Correlation coefficients ranging from 0 to ±0.29 indicate low-level relationships, from ±0.29 to ±0.69 indicate medium-level relationships, and from ±0.70 to 1 indicate high-level relationships. The computed correlation coefficients are displayed in Table 8.

Table 8
Pearson correlation coefficients of the relationships between the factors of the professional development models tendency scale

	Factors	*Mean*	*SD*	*1.*	*2.*	*3.*	*4.*	*5.*
1.	Factor 1	49.36	9.19	1				
2.	Factor 2	25.81	2.89	.668**	1			
3.	Factor 3	28.63	3.36	.359**	.542**	1		
4.	Factor 4	17.96	3.62	.519**	.404**	.185**	1	
5.	Overall scale	121.75	15.26	.931**	.807**	.583**	.667**	1

Note. $p < .01$; N = 408

When reviewing Table 8, it is evident that there are low to medium level positive and significant relationships between the factors of the Professional Development Models Tendency Scale. Additionally, moderate to high level positive and significant relationships were found between the total score obtained from the scale and its factors. The results overall indicated that the scale demonstrated internal consistency.

4. Discussion, Conclusion and Recommendations

The primary aim of this study was to develop a valid and reliable measurement tool to identify teachers' tendencies towards professional development models. The findings from the research suggest that the Professional Development Models Tendency Scale [PDMTS] is a promising tool for assessing these tendencies, showing potential for use in this context.

The analyses conducted—including Exploratory Factor Analysis and Confirmatory Factor Analysis—demonstrated that the scale comprises four factors: '*Tendency towards observation-based*

professional activities, Belief in collaboration with colleagues, Participation in collaborative activities, and Resistance to observation and supervision.' The scale's high internal consistency, evidenced by a Cronbach's alpha of 0.94 for the overall scale and individual alpha values ranging from 0.72 to 0.88 for the factors, indicates its reliability as a measurement tool. Furthermore, the significant positive correlations among the scale's factors suggest that they are interrelated and contribute collectively to the construct of professional development tendencies.

The study also highlights the critical role that professional development plays in enhancing teaching quality and promoting effective educational practices. In light of the challenges faced by teachers in accessing high-quality professional development opportunities, there is a pressing need for tailored models that meet the diverse needs of educators. The results indicate that teachers value observation-based and collaborative professional development activities, which can foster a supportive learning environment and improve teaching practices.

When studies conducted within the country are examined, it has been found that domestic studies related to the subject have generally focused on various aspects of teachers' professional development and its impacts. One study adapted a professional development efforts scale for middle school math teachers (Balbağ et al., 2017). Another examined the relationships between teachers' professional values, attitudes, and concerns, with concerns mediating the relationship between values and attitudes (Aktan et al., 2020). Bümen (2009) analyzed the effects of a professional development program on teachers' self-efficacy and classroom practices, while Özer and Beycioğlu (2010) investigated the relationship between primary school teachers' attitudes toward professional development and their burnout levels. Together, these studies highlight the importance of supporting teachers' growth and well-being through targeted development efforts.

On the other hand, In studies conducted abroad on teachers' professional development, the focus has generally been on a comprehensive view of how to conceptualize and measure the impact of teacher professional development. Desimone (2009) identifies essential dimensions such as content focus and collective participation, while Guskey (2002) offers a model linking teacher change to professional development. Opfer and Pedder (2011) propose a framework considering multiple factors influencing teacher learning, and Avalos (2011) reviews tools for assessing professional development over a decade. Vescio et al. (2008) focus on the role of professional learning communities, and Ingvarson et al. (2005) explore factors affecting program success and suggest evaluation scales. Kennedy (2016) further analyzes the impact of various professional development approaches on teaching practices. However, no studies within this body of research have specifically aimed to identify teachers' tendencies towards professional development models. Therefore, it is believed that this study will make a valuable contribution to the existing literature.

Considering all the reasons and outcomes explained above, the following recommendations can be made to further enhance the effectiveness of professional development programs in educational institutions:

- *Implement Observation-Based Models*: Schools and educational authorities should adopt observation-oriented professional development models, allowing teachers to observe and learn from each other's practices. This approach encourages collaborative learning and provides opportunities for constructive feedback.
- *Encourage Collegial Collaboration*: Fostering a culture of collaboration among teachers can significantly enhance professional development. Schools should create structures that facilitate regular meetings and discussions among educators, allowing them to share experiences, resources, and strategies.
- *Customize Professional Development Programs*: Professional development initiatives should be tailored to meet the specific needs and preferences of teachers. This can be achieved by conducting needs assessments to understand the areas where teachers seek improvement and designing programs accordingly.

- *Provide Continuous Support*: Long-term support and follow-up should be integral components of professional development programs. Institutions must ensure that teachers have access to ongoing assistance and resources as they integrate new practices into their teaching.
- *Evaluate and Revise Programs*: Continuous evaluation of professional development programs is essential to assess their effectiveness and relevance. Feedback from teachers should be collected regularly to inform the improvement of these initiatives.

By addressing the specific needs and preferences of teachers, educational institutions can design more effective professional development programs that lead to improved teaching quality and better student outcomes. The Professional Development Models Tendency Scale (PDMTS) can serve as a valuable tool for assessing teachers' tendencies and guiding the development of these programs, fostering a more supportive and effective educational environment. Moreover, future research could investigate the relationship between teachers' tendencies towards professional development models and other variables, such as teaching efficacy, job satisfaction, student engagement, and academic performance. This would provide further insight into the factors that contribute to the success of professional development initiatives.

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Appendix 1. Professional Development Models Tendency Scale (PDMTS)

Item	*Statement*	*1*	*2*	*3*	*4*	*5*
1	My colleagues can make an observation in my classroom to evaluate my lesson.					
2	There is NO need to visit different schools.					
3	Preparing plans, course materials and assessment tools with my colleagues contributes to my professional development.					
4	I would like to observe the assessment and evaluation processes of my colleagues.					
5	I expect my colleague who observes my class to give me feedback.					
6	I can use the feedback I receive from my colleagues to re-plan my teaching.					
7	Collaborating with my colleagues reduces my workload.					
8	Observing lessons at regular intervals can be beneficial to the professional development of the observed teacher.					
9	Exchanging ideas with my colleagues about preparing plans, course materials, and assessment tools makes me feel safe.					
10	Collaborating with my colleagues on various issues gives me different perspectives.					
11	Conducting short lesson observations (10 or 15 minutes) in school can be beneficial for the professional development of the observing teacher.					
12	I wonder how my colleague handles topics that students are having difficulty in learning.					
13	I think that teachers from different schools observing each other does NOT have a positive contribution to professional development.					
14	When I get together with my colleagues (inside or outside of school), I talk about how we can improve the learning process / students.					
15	I am curious about the teaching process of my colleagues.					
16	I think that short lesson observations will NOT be very beneficial to the professional development of my observing colleague.					
17	It may be useful for teachers to observe different schools outside the school they work in.					
18	Together with our colleagues, we carry out systematic studies to improve the quality of education.					
19	I think that recording and watching a teacher's own lesson will NOT contribute to his/her professional development.					
20	After my lesson is observed for evaluation purposes, I would like to participate in professional development activities in the areas in which I am lack of.					
21	We have conversations with my colleagues about the quality of education.					
22	We examine and select materials such as textbooks etc. together with my colleagues.					
23	We try to solve the problems we encounter at school in a planned way together with my colleagues and administrators.					
24	We have conversations with my colleagues about professional development.					
25	I think it would be beneficial for lesson observations to be made by teachers from different fields.					
26	I would like to benefit from my colleagues' learning -teaching processes by observing their lessons.					
27	My colleagues can observe my lesson to improve their learning-teaching processes.					
28	My colleagues can observe my lesson to improve their assessment and evaluation processes.					
29	I think that observing my colleagues' teaching processes is NOT necessary for professional development.					
30	When we get together with my colleagues, we share about the activities we implement in class.					
31	I would like to benefit from my colleagues' classroom management skills by observing their lessons.					

Note. EFA and CFA were conducted on the Turkish version of the scale.

Appendix 2 (Turkish version). Mesleki Gelişim Modelleri Eğilim Ölçeği (MGMEÖ)

Madde	*İfadeler*	*1*	*2*	*3*	*4*	*5*
1	Meslektaşlarım, dersimi değerlendirmek için sınıfımda gözlem yapabilirler.					
2	Farklı okulları ziyaret etmeye gerek yoktur.					
3	Meslektaşlarımla beraber planlar, ders materyalleri ve ölçme değerlendirme araçları hazırlamak mesleki gelişimime katkı sağlar.					
4	Meslektaşlarımın ölçme değerlendirme süreçlerini gözlemeyi isterim.					
5	Dersimi gözleyen meslektaşımdan bana dönütler vermesini beklerim.					
6	Meslektaşlarımdan aldığım dönütleri öğretimi yeniden planlamada kullanabilirim.					
7	Meslektaşlarımla işbirliği yapmak iş yükümü azaltır.					
8	Belli aralıklarla ders gözlemi yapılması, dersi gözlenen öğretmenin mesleki gelişimine yararlı olabilir.					
9	Planlar, ders materyalleri ve ölçme değerlendirme araçları hazırlamak konusunda meslektaşlarımla fikir alışverişinde bulunmak kendimi güvende hissettirir.					
10	Meslektaşımla çeşitli konularda iş birliği yapmak bana farklı bakış açıları kazandırır.					
11	Okul içinde kısa ders gözlemleri (10 ya da 15 dakikalık) yapılması, gözlem yapan öğretmenin mesleki gelişimi için faydalı olabilir.					
12	Meslektaşımın, öğrencilerin öğrenmekte zorlandıkları konuları nasıl ele aldığını merak ederim.					
13	Farklı okullardan öğretmenlerin birbirini gözlemesinin mesleki gelişime olumlu bir katkısı olmadığını düşünürüm.					
14	Meslektaşlarımla bir araya geldiğimde (okul içinde veya dışında) öğrenme sürecini / öğrencileri nasıl geliştirebileceğimizi konuşurum.					
15	Meslektaşlarımın ders işleyişini merak ederim.					
16	Kısa ders gözlemlerinin, gözlem yapan meslektaşımın mesleki gelişimine çok faydalı olmayacağını düşünürüm.					
17	Öğretmenlerin çalıştıkları okul dışında farklı okullarda gözlem yapması yararlı olabilir.					
18	Meslektaşlarımızla beraber eğitimin kalitesini artırmak adına sistematik çalışmalar yürütürüz.					
19	Öğretmenin kendi dersini kayıt altına alması ve izlemesinin mesleki gelişimine herhangi bir katkısı olmayacağını düşünürüm.					
20	Değerlendirme amacıyla dersim gözlendikten sonra, eksik olduğum konularda mesleki gelişim çalışmalarına katılmayı isterim.					
21	Meslektaşlarımla eğitimin niteliği üzerine konuşmalar yaparız.					
22	Ders kitapları vb. materyalleri meslektaşlarımla beraber inceler ve seçeriz.					
23	Okulda karşılaştığımız sorunları meslektaşlarım ve yöneticilerle beraber planlı bir şekilde çözmeye çalışırız.					
24	Meslektaşlarımla mesleki gelişim üzerine konuşmalar yaparız.					
25	Ders gözlemlerinin farklı branşlardan öğretmenlerce yapılmasının yararlı olacağını düşünürüm.					
26	Meslektaşlarımın derslerini gözleyerek onların öğrenme-öğretme süreçlerinden faydalanmak isterim.					
27	Meslektaşlarım, öğrenme –öğretme süreçlerini geliştirmek için dersimi gözleyebilirler.					
28	Meslektaşlarım, ölçme değerlendirme süreçlerini geliştirmek için dersimi gözleyebilirler.					
29	Meslektaşlarımın öğretim süreçlerini gözlemenin, mesleki gelişim için gerekli olmadığını düşünürüm.					
30	Meslektaşlarımla bir araya geldiğimizde sınıfta uyguladığımız etkinlikler hakkında paylaşımda bulunuruz.					
31	Meslektaşlarımın derslerini gözleyerek onlardan sınıf yönetimi konusunda faydalanmak isterim.					

Note. EFA and CFA were conducted on the Turkish version of the scale.