IJERE International Journal of Educational Research Review

International Journal of Educational Research Review

The Relationship between Teachers' Professional Learning, School Culture, and Teachers' Demographic Characteristics

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Article History:
Received 13.04.2023
Received in revised form 30.06.2023
Accepted
Available online 13.07.2023

The professional development of teachers, which has been identified to have a significant impact on student achievement, is a frequently discussed topic, but the factors that influence teachers' professional learning remain unclear. Clarifying the aspects that affect teachers' professional learning can help support professional learning in schools. Understanding the relationship between school culture and teachers' professional learning, as well as other factors that may affect teachers' professional learning, can assist to the development of strategies aimed at improving teacher qualifications, which is one of the most important components of education systems, and consequently increasing student achievement.This research was carried out to examine the relationship between teachers' professional learning and school culture. The research was carried out with 361 teachers working in official primary, secondary, and high schools in Bakırköy district of Istanbul province in the 2022-2023 academic year. The research is descriptive and designed as a quantitative study based on the relational survey model. The data of the study were collected with the "Teacher Professional Learning Scale" and the "School Culture Scale". The data were collected face to face and online. Statistical programs such as SPSS v26.0, normality test (Kolomogorov Smirnov), descriptive statistics (frequency analysis, descriptive statistics), independent group comparison (independent sample t-test, One Way ANOVA), Pearson Correlation Analysis, and multivariate regression analysis were used for the analysis of the data obtained.In the study, it was found that teachers have a high score of professional learning and there is a very strong positive correlation between the score of professional learning and the score of school culture. It was also found that teacher collaboration and goal integrity, as dimensions of school culture, have a positive effect on professional learning, while collaborative leadership has a negative effect. Based on the findings of the research, some recommendations have been presented for practitioners and policy makers.

Keywords: Teacher professional learning, school culture, teacher professional development

INTRODUCTION

Previous studies on the factors affecting student achievement have shown that the teacher factor significantly affects student achievement (Akkurt & Karabağ Köse, 2019; Çobanoğlu & Kasapoğlu, 2010; Duru et al., 2010; Deryakulu & Geçer, 2004; Sünbül, 1996). As teacher qualifications significantly affect student achievement, understanding the factors that affect teacher professional learning will create positive outcomes for student achievement.

It is known that continuing professional learning for teachers during their work lives positively affects their performance in their profession. However, the factors that affect their professional learning continue to be uncertain (Caspersen, 2015). While the professional learning of teachers appears in various forms in the literature, the understanding that lies at the heart of professional learning is that teachers learn, learn how to learn, and turn their knowledge into practice for the development of their students. The professional learning of teachers is a versatile process that requires individual and collective cognitive and emotional participation of teachers, as well as evaluating appropriate alternatives for improvement or change. All of this occurs in educational policy environments or school cultures that are more favorable than others.

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Therefore, there is a need to work on the traditions and interactive connections of teacher groups in examining the professional development of teachers (Avalos, 2010). In today's world, which has become global with the rapid developments in science, technology, and communication, there is a significant role for teachers in the efforts to provide students with 21st-century skills in the field of education. Therefore, the development of teachers has become an area that is heavily focused on and worked on. It has become an increasingly important issue to uncover the factors that affect the professional learning of teachers who have a significant impact on student achievement since it has been observed that the teacher factor is a determining factor in student success (Sanders & Rivers, 1996; Sanders, Wright, & Horn, 1997; Jordan, Mendro, & Weerasinghe, 1997; Sarıer, 2014). Barber and Mourished's determination that the perfection of an education system cannot surpass the goodness of teachers has received wide attention and was included in the 2010 PISA report. It is observed that teacher qualifications are given great importance in successful countries in international exams such as PISA and TIMSS. The successes of Finland, which is one of the countries that give the most importance to teacher qualifications and development, in PISA are remarkable. In the OECD report "Creating Effective Teaching and Learning Environments" (2009), the importance of focusing on professional development through the International Teaching and Learning Study (TALIS) and providing continuous and effective professional development was accepted. The OECD's studies also emphasize the importance of continuous professional development programs that focus on individual and institutional needs. The 2023 Education Vision Document organized by the Ministry of National Education states that the professional learning of teachers is of primary importance for school development and emphasizes the role of teachers who collaborate with colleagues and other professional communities to improve student achievement (Turkish Ministry of Education, 2018).

Teacher professional development can be delineated as the continuous process of having the necessary qualifications to effectively carry out their work from the entry of teachers into the profession until they retire (Özer, 2008). Professional development refers to the processes and activities designed to increase teachers' professional knowledge and skills. By utilizing these processes and activities, it is expected that teachers will be more effective in their students' learning activities (Guskey, 2000). The terms professional development and professional learning are often used interchangeably (Donohoo, 2017). In Campbell's (et al., 2017) study, the principles and conditions of effective professional learning were identified as the quality of content being evidence-based and informed, having sufficient pedagogical knowledge about the subject being taught, focusing on student outcomes, and having teacher expectations aligned with system characteristics. In terms of learning design and implementation, the principles of active learning and diversity in learning activities, collaborative learning, and the connection between the learning subject and the profession were reached. In terms of sustainability, Campbell's (et al.) research showed that continuity over time, having supportive leadership, having sufficient resources, and the principles and conditions of effective professional learning are necessary.

The innovations and new education policies shaped by high student achievement expectations have led to a focus on teachers who play a key role in implementing these innovations in the classroom. Due to the intertwined elements of policy implementation and teacher change, groups have emerged to research teacher development, especially emphasizing social learning contexts (Kooy & Van Veen, 2012).

Professional development can take place both outside and inside of school. Out-of-school professional development applies to programs such as courses, seminars, and conferences. Out-of-school professional development has some negative aspects such as its economic and social burden on the organization organizing the event and the teachers participating in it, as well as requiring changes in social life for participation (Özer, 2008).

School-based professional development includes activities that have been organized for teachers in the school and are functional because such events are tailored to the needs of a precise group of teachers and are suitable for the culture of the school (Craft, 2002). School-based professional development activities direct teachers towards group work and research, in addition to events such as courses and seminars. These activities can be carried out by external experts or by the school's own teachers and administrators. School-based professional development produces positive results because it meets the needs of the school's teachers and is carried out by the school's own teachers. For this reason, many countries have turned to school-based professional development (Özer, 2008).

Continuous learning is more important in professional development than temporary events that are held at intervals. It has been seen that professional development events held for temporary periods do not adequately

meet the development needs of teachers and that this should be a gradual process (Cordingley et al., 2015; Darling-Hammond et al., 2009; Timperly, 2008). It is obvious that teachers play a role in the development of the school, but improving the quality of teaching requires more than just acquiring some tips and tricks that can be applied in the classroom (Kooy & Van Veen, 2012).

According to the results of research, it has been seen that school-based, continuous, and teacher-centered programs that support collaboration between teachers increase teachers' professional learning (Darling-Hammond, 2010; Goe & Stickler, 2008).

Therefore, the concept of professional learning that encompasses the learning experiences that teachers constantly encounter in school is at the forefront.The concept of professional development is considered an outdated term that evokes activities where teachers are passive and only knowledge is transmitted. Instead, a new understanding has emerged that emphasizes active participation of teachers in their own professional development, collaboration with colleagues, focus on classroom practices, and is referred to as professional learning (Easton, 2008). Professional development activities include various events such as informative meetings, one-day workshops, training programs, book and reading clubs, research projects, coaching and counseling, mentoring, classroom observations, and participation in working groups. Most of the current professional development activities are characterized as traditional (mostly listening to a presentation, one-day workshops, seminars, conferences). The traditional label refers to the way professional development activities were designed ten years ago. In traditional activities, teachers take on a passive role and the content is not organized according to the situations and problems teachers encounter in their daily practice. In renewed practices, teachers take on an active role and determine the topics based on their own teaching practices. Some examples of this include professional collaboration, study and book clubs, mentoring, coaching, and teacher-led research. Teacher professional learning communities that emphasize collective responsibility for student learning and insights into teaching can be given as examples of learning communities contributing to student learning (Kooy & Van Veen, 2012).

Although various researchers have made many definitions of school culture, it can generally be defined as the set of rules, behaviors, beliefs, and values adopted in a school, as well as the relationships between administrators, teachers, and students (Karal, 2011). Research on the impact of school culture on teachers and students has gained importance in recent years. Sociologists realized the importance of school culture in the 1930s, and education researchers began to establish a connection between the qualities of the school climate and its impact on education in the late 1970s. However, despite its significance, school culture is one of the least mentioned topics in terms of improving student achievement (Jerald, 2006).

Social interaction is a component of behavioral responses and can affect learning behavior through social support in the workplace (Caspersen, 2015). The culture of a school guides not only students but also teachers on how to behave in the school. The culture of a school, whether positive or negative, stems from its vision and shared values. However, the strength or weakness of the culture is dependent on symbols, behaviors, ceremonies, and traditions related to the vision. Educators should utilize every tool available, including organizational culture, to achieve higher student success. In effective schools, employees are aware of and work to support the accepted elements of the school culture. For example, if student success is the prominent element of school culture, the most effective teachers teach the students with the highest expectation for success. If parental involvement is an important element, all employees work with parents. (Jerald, 2006). In schools with a strong culture, teachers with different values and beliefs unite around the common culture of the school (Fırat, 2007). A professional learning community spontaneously formed in schools with a strong culture enables teachers to continue their professional development and work together for student success by collaborating with each other and the administration (Fullan, 1998, 1993).

The connection between school culture and teachers' professional learning is a topic that has not been frequently researched. There are still unexplored aspects of this topic and more research is needed to determine which factors are influential in this regard.

Based on this, the main aim of this research is to uncover the relationship between teachers' professional learning and school culture. In addition, the study examines the relationship between teachers' level of professional learning and demographic variables such as their field of expertise, educational level, length of service, and age.

Professional Learning

According to Fullan and Stiegelbauer (1991), professional development is the combination of formal and informal learning experiences that a person acquires from before career services to retirement. In order for professional development activities to be effective, they must be based on teachers' identified needs, consist of comprehensive, sustainable, and systematic learning experiences, result in instructional effectiveness, and increase student success and performance outcomes (Ilgan, 2013).

The characteristics that teachers' vocational development activities are expected to have under the No Child Left Behind Act, which was introduced in the field of education in the United States in 2001, can be listed as follows: increasing teachers' knowledge of their subject matter, providing chances for teachers to acquire knowledge and skills to meet standards, improving classroom management skills, designing the activities in a classroom-focused, high-quality, and sustainable manner to have a positive and lasting impact on the teacher's performance, not being a one-day or short-term workshop or conference, being able to advance effective teaching strategies, academic achievements of students, and teachers' knowledge and teaching skills to a higher level, providing opportunities for teachers to improve their use of technology in the classroom, and informing teachers about instructional methods they can use for students with special education needs. According to Hunzicker, effective professional development activities are embedded into the work, they are instructional, they are collaborative, and they have ongoing elements (cited in Ilgan, 2013). According to Musanti and Pence (2010), professional development should be designed as collaborative initiatives that produce mutual exchange, dialogue, and creativity (cited in Ilgan, 2013).

Recently, it has been observed that there is a tendency towards effective professional development activities that contribute to teachers' daily practices rather than passive activities that teachers acquire from experts. The concept of professional development, which is now outdated, evokes activities where expert knowledge is passively acquired by teachers. However, this understanding has been replaced by a teacher's vocational learning, where teachers actively participate in their own professional development process, based on collaboration with colleagues and classroom practices (Easton, 2008).

Organizational Culture and School Culture

Organizational culture was first brought to the agenda by Theory Z of Ouchi and Peters and Waterman's approach to management excellence. These approaches initially appeared unconventional, but they highlighted the importance of human-centered management, treating people with respect, innovation, and quality. Schein (1990) defined organizational culture as the fundamental approaches that enable a group to work effectively, which are adopted by new members of the organization, and provide internal harmony together with external integration. The characteristics of organizational culture include being distinctive, symbolic, unifying, accepted, having a stable structure, reflecting top management, and being understood without being expressed. Each organizational culture is unique and creates distinctive features that set it apart from others (Akinci Vural, 2016). According to Sadri (2014), the concepts of organizational culture and corporate culture express how individuals in an organization define themselves and behave, and can be used interchangeably. These concepts are a system of meanings that are transmitted among employees and have a similar effect on employees as fashion in national culture (cited in Kurt, 2016).

According to Sahin Firat (2010), organizational culture is a compilation of beliefs, values, and norms shared by organizational members, and is the predominant element that enables managers and employees to act together. School culture is determined by the communication among teachers, administrators, and support staff.

If the school culture does not support learning, it has been observed that student achievement is negatively affected (Watson, 2001). According to Balci (2002), to achieve success in a school, a culture must be established that values success, has high expectations for success, and prioritizes effective learning and collaboration (cited in Sezgin, 2010). Schools with a strong culture have teachers with higher motivation. Teachers with higher motivation perform better in achieving student success. School leaders who work to improve student achievement should focus on developing school culture by regulating relationships among stakeholders, including teachers, school administrators, students, and parents (Busch et al., 2009).

METHOD

This research is a descriptive study that examines the relationship between teachers' professional learning and school culture, and is designed as a quantitative study based on the relational survey model. The population of the study consists of 1745 teachers working in public primary, secondary, and high schools in Bakırköy district of Istanbul province. The sample was selected from elementary, middle, and high school teachers using simple

random sampling method, and data obtained from 361 teachers who participated in the research on a voluntary basis were analyzed. Using the Cochran formula for estimating the sample size; where:
n: Sample size
p: Proportion of X observed in the population, q (1-p): Proportion of X not observed
$Z\alpha$: Z-score corresponding to α=0.05, which is 1.96
d: Sampling error = 0.05
Using the values provided:
$n = Z^2 * p * q / d^2$
$n = 1.96^2 * 0.35 * 0.65 / 0.05^2$
n = 350
Therefore, according to the Cochran formula, a sample size of 350 is required to estimate the proportion of interest with a confidence level of 95% and a margin of error of 0.05. The sample size in this study is above the number 350.
In this study, the Teacher Professional Learning Scale and School Culture Scale were used to collect data. In addition, the first part of the data collection form includes questions to determine the participants' gender, education level, field of study, length of service, and the teaching level they are currently working in.
The Teacher Professional Learning Scale was developed by Liu, Hallinger, and Feng (2016) and adapted to Turkish by Gümüş, Apaydın, and Bellibaş (2018). The scale consists of four dimensions and 27 items. The dimensions of the Professional Learning Scale are collaboration, reflection, application, and accessing knowledge base.
The School Culture Scale was developed by Gruenert and Valentine (1998) and adapted to Turkish by Altun and Yurtseven (2019). The School Culture Scale consists of 35 items and six dimensions. The dimensions of the scale are collaborative leadership, teacher collaboration, professional development, goal integrity, colleague support, and learning partnership.
For data analysis, statistical programs such as SPSS v26.0, normality test (Kolmogorov-Smirnov), descriptive statistics (frequency analysis, descriptive statistics), independent group comparison (independent samples t-test, one-way ANOVA), Pearson correlation analysis, and multivariate regression analysis were used to evaluate the prediction of the dependent variable by the independent variable.
The equivalence, validity, and reliability studies of the Teacher Professional Learning Scale and School Culture Scale were conducted. The Cronbach's alpha coefficient ranges for the professional learning scale were 0.79-0.94 and for the school culture scale were 0.83-0.98. Overall, these scales have measured the phenomenon to be measured very well, and a very reliable result has been obtained.

Table 1: Analysis of the Normality Distribution of Teachers' Professional Learning and School Culture Scale Scores

	Kolmogorov Smirnov			Skewness	Kurtosis
	Test statistic	sd.	p		
Professional Learning	0,060	361	0,003	-1,067	1,148
Collaboration	0,122	361	0,000	-1,161	1,607
Reflection	0,097	361	0,000	-0,995	1,954
Application	0,146	361	0,000	-1,011	1,920
Accessing knowledge base	0,103	361	0,000	-0,647	1,559
School Culture	0,072	361	0,000	-0,697	0,645
Collaborative leadership	0,113	361	0,000	-0,648	0,093
Teacher collaboration	0,092	361	0,000	-0,531	0,315
Professional development	0,126	361	0,000	-0,840	0,979
Goal integrity	0,131	361	0,000	-0,777	0,852
Colleague support	0,140	361	0,000	-0,722	0,405
Learning partnership	0,112	361	0,000	-0,683	0,450

In the study, the normality distribution of the scale scores for teachers' professional learning and school was evaluated using the Kolmogorov Smirnov test. The scores did not show a normal distribution ($p<0.05$).

However, despite the scores not following a normal distribution, it was assumed that the data for the scale scores were normally distributed due to the skewness and kurtosis values being within ±2, which are the other assumptions of normality, and the sample size being n>30 and above.

Findings

Table 2: Descriptive Statistics of Teachers' Professional Learning and School Culture Statistics

	N	$\bar{X}$	Ss	Min.	Maks.
Professional Learning	361	4,19	0,52	1	5
Collaboration	361	4,22	0,65	1	5
Reflection	361	4,17	0,56	1	5
Application	361	4,34	0,58	1	5
Accessing Knowledge Base	361	4,06	0,60	1	5
School Culture	361	3,72	0,76	1	5
Collaborative Leadership	361	3,61	0,87	1	5
Teacher Collaboration	361	3,62	0,78	1	5
Professional Development	361	3,85	0,78	1	5
Goal Integrity	361	3,85	0,79	1	5
Colleague Support	361	3,80	0,82	1	5
Learning Partnership	361	3,60	0,88	1	5

The scales for professional learning and school culture were considered with a minimum score of 1 and a maximum score of 5. Based on the average, the minimum and maximum values can be expressed as a midpoint of 3 points. Scores above 3 indicate a more intense presence or participation in the relevant dimension. In this context, when the descriptive statistics of teachers' scores on the professional learning and school culture scales are evaluated in the study, the average score for collaboration in the vocational learning dimension is 4.22, reflection is 4.17, application is 4.34, accessing knowledge base is 4.19, and the overall average score is 4.19. Based on this, it can be understood that teachers have a high score of professional learning.

From the school culture dimensions, the average score for collaborative leadership is 3.72, teacher collaboration is 3.61, professional development is 3.85, goal integrity is 3.85, colleague support is 3.80, learning partnership is 3.60, and the overall average score is 3.72.

Table 3: ANOVA Test Results of Teachers' Professional Learning Scale Scores by Educational Level

	Education Level	n	X⁻	ss	F	Sd	P
Collaboration	Associate's Degree	12	4,56	0,45	1,656	2, 358	0,192
	Bachelor's Degree	268	4,21	0,64			
	Graduate Degree	81	4,20	0,68			
Reflection	Associte's Degree	12	4,63	0,38	4,454	2, 358	0,012*
	Bachelor's Degree	268	4,16	0,56			
	Graduate Degree	81	4,11	0,58			
Application	Associate's Degree	12	4,63	0,41	1,619	2, 358	0,200
	Bachelor's Degree	268	4,33	0,57			
	Graduate Degree	81	4,34	0,60			
Access to Knowledge Base	Associate's Degree	12	4,36	0,44	1,79	2, 358	0,169
	Bachelor's Degree	268	4,06	0,60			
	Graduate Degree	81	4,01	0,60			
Professional Learning	**Associate's Degree**	**12**	**4,55**	**0,37**	**3,227**	**2, 358**	**0,041***
	Bachelor's Degree	**268**	**4,18**	**0,51**			
	Graduate Degree	**81**	**4,15**	**0,54**			

One-Way ANOVA testi *p<0.05

The reflection average score of the professional learning dimensions shows a significant difference according to the education levels of the teachers. The reflection average score of the teachers trained at the associate degree level (4.63±0.38) is significantly higher than the average score of the teachers trained at the undergraduate and graduate levels.

The average score of professional learning varies significantly according to the education levels of the teachers. According to the results of the Tukey HSD test, the average score of professional learning for teachers trained at the associate degree level (4.55±0.37) is significantly higher than the average score of teachers trained at the undergraduate and graduate levels.

Table 4: Independent Sample t-Test Results of the Professional Learning Scale Scores of Teachers According to Branch Status

	Branch	n	X⁻	ss	T	Sd	P
Collaboration	Regular Classroom Teacher	85	4,31	0,55	1,456	359	0,146
	Others	276	4,20	0,67			
Reflection	Regular Classroom Teacher	85	4,20	0,52	0,586	359	0,558
	Other	276	4,16	0,58			
Application	Regular Classroom Teacher	85	4,47	0,51	2,443	359	0,015*
	Other	276	4,30	0,59			
Accessing Knowledge Base	Regular Classroom Teacher	85	4,16	0,50	1,891	359	0,059
	Other	276	4,02	0,62			
Professional Learning	**Regular Classroom Teacher**	**85**	**4,27**	**0,44**	**1,819**	**170,38**	**0,071**
	Other	**276**	**4,16**	**0,54**			

Independent samples t test, *p<0.05

When the average scores of the professional learning scale of teachers were evaluated by independent sample t-test according to the branch status in the study, it was observed that the average score of the application dimension of professional learning of teachers who teach in the regular classroom branch (4.47±0.51) was significantly higher than the average score of teachers in other branches.

Table 5: Regression Analysis Results on the Prediction of Teachers' Professional Learning by School Culture

Professional Learning	F (p)	Sd	ß	T	P	R^2
Constant				22,541	0,000**	
Collaborative Leadership			-0,256	-2,383	0,018*	
Teacher Collaboration			0,438	3,824	<0,001***	
Professional Development	29,482 (<0.001)	6, 354	0,180	1,606	0,109	0.33
Goal Integrity			0,261	2,466	0,014*	
Colleague Support			-0,109	-1,022	0,307	
Learning Partnership			0,071	0,933	0,352	

Sd: Degrees of freedom, Regression Analysis, *p<0.05

When the results of the regression analysis on the prediction of teachers' professional learning by school culture dimensions were evaluated in the study; collaborative leadership (ß= - .26, t(359): -2.383, p<0.05) had a negative and significant effect, while teacher collaboration (ß= .44, t(359): 3.824, p<0.001) and goal integrity (ß= .26, t(359): 2.466, p<0.05) had positive and significant effects on professional learning, explaining 33% of the total variance (F(6, 354): 29.482, p<0.001). Teacher collaboration and goal integrity, as dimensions of school culture, had a positive effect on professional learning, while collaborative leadership had a negative effect.

A positive and high-level relationship has been detected between school culture dimensions and professional learning dimensions. There is a very strong and meaningful relationship between teachers' professional learning and school culture. According to the current research results, school culture is seen as a predictor of professional learning. Among the dimensions of school culture, teacher collaboration and goal integrity have a positive impact on professional learning, while collaborative leadership has a negative impact. Among the dimensions of school culture, collaboration and goal integrity positively predict teachers' professional learning, while collaborative leadership negatively predicts it.

Teachers' professional learning is at a high level. Teachers participate in professional learning activities mainly in the dimension of application and least in the dimension of accessing knowledge base. Teachers' professional learning score varies according to school level. The average professional learning score is lower for teachers working at the high school level compared to those working at the elementary and middle school levels. The school culture score of teachers working at the high school level is lower than the score of teachers working at the elementary and middle school levels in all dimensions and in average.

In the reflection dimension of teachers' professional learning score, it is lower for teachers working at the high school level compared to those working at the elementary school level. In the dimensions of application and accessing knowledge base, it is lower for teachers working at the high school level compared to those working at the middle and elementary school levels.

Teachers' professional learning in the dimension of collaboration shows significant differences by age. According to the research results, the collaboration score of teachers aged 56 and over is significantly higher than the average score of teachers aged 36-45. The school culture teacher collaboration score of teachers under 35 and over 56 is higher than the score of teachers aged 36-45. The school culture collaborative leadership score of teachers under 35 is higher than the score of teachers aged 36-45 and 46-55.

The professional learning score varies by teachers' education level. The reflection score and the average professional learning score of teachers with associate degree education are higher than those of teachers with bachelor's and graduate degree education. The teacher collaboration and professional development score of the school culture dimensions differs according to the educational level of the teachers. The school culture collaboration score and professional development score of teachers with associate degrees are higher than those of teachers with bachelor's and graduate degrees.

The professional learning score of regular classroom teachers is higher than that of other teachers in the application dimension. The school culture score of regular classroom teachers is higher than that of teachers in other branches in all dimensions and on average. The school culture score of teachers working at the high school level is lower than the score of teachers working at the elementary and middle school levels in all dimensions and in average.

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In the reflection dimension of teachers' professional learning score, it is lower for teachers working at the high school level compared to those working at the elementary school level. In the dimensions of application and accessing knowledge base, it is lower for teachers working at the high school level compared to those working at the middle and elementary school levels.

Teachers' professional learning in the dimension of collaboration shows significant differences by age. In line with the research results, the collaboration score of teachers aged 56 and over is significantly higher than the average score of teachers aged 36-45. The school culture teacher collaboration score of teachers under 35 and over 56 is higher than the score of teachers aged 36-45. The school culture collaborative leadership score of teachers under 35 is higher than the score of teachers aged 36-45 and 46-55.

The professional learning score varies by teachers' education level. The reflection score and the average professional learning score of teachers with associate degree education are higher than those of teachers with bachelor's and graduate degree education. The teacher collaboration and professional development score of the school culture dimensions differs in accordance with the educational level of the teachers. The school culture collaboration score and professional development score of teachers with associate degrees are higher than those of teachers with bachelor's and graduate degrees.

The professional learning score of regular classroom teachers is higher than that of other teachers in the application dimension. The school culture score of regular classroom teachers is higher than that of teachers in other subjects in all dimensions and on average. The school culture score differs by professional seniority in the dimensions of collaborative leadership and goal integrity.

CONCLUSION and DISCUSSION

The professional learning score of teachers is high. This finding is consistent with the finding reached in Savaş's (2021) research. Teachers participate mostly in professional learning activities that involve improving teaching and solving problems related to teaching, such as developing alternative ideas and materials and trying them out in the classroom, which are part of the dimension of applying. Teachers participate professional learning activities which are in reaching knowledge base dimension the least. Similarly, Bakkanes, Vermunt, and Wubbels (2010) found in their research that one of the most common types of professional learning activities that teachers participate in is of the application type.

According to these findings, teachers are heavily involved in professional learning activities such as planning instruction, discussing and evaluating student achievement with other teachers, utilizing feedback from students and other teachers, developing alternative ideas, materials and practices to improve teaching and solving problems related to teaching. This result can be explained by the fact that professional learning is based on the interactions that teachers have with their colleagues and students during their teaching practices, and does not require a separate location, time or organization.

According to the research results, teachers engage less in professional learning activities that involve reaching the knowledge base. This finding can be interpreted as teachers using professional learning activities that

involve accessing different sources to improve their teaching less frequently than other activities. This result can be explained by the fact that teachers may not be utilizing physical or online libraries or platforms that provide access to resources and teaching materials that can facilitate their access to the knowledge base.

To facilitate teachers' access to the knowledge base, it is recommended to provide them with access to physical or online libraries and platforms that offer resources and teaching materials that can support their professional development. Online platforms can be organized and enriched, where teachers can access various teaching materials and resources. Increasing and enriching such platforms, making them functional, and providing technological support to teachers, as well as introducing existing platforms to teachers, can support their professional learning in accessing their knowledge base. Additionally, teachers could benefit from professional learning activities that focus on reaching the knowledge base, such as attending conferences, participating in workshops, and engaging in online courses. Moreover, teachers should be encouraged to collaborate and exchange ideas with their colleagues to foster a culture of continuous professional learning and development.

It has been determined that reflective learning activities receive the second-lowest score. This result reveals that some of the professional learning activities that teachers least resort to are activities such as utilizing feedback from students and teachers to improve and change teaching strategies, observing the teachings of other teachers, and storing teaching-related data for later use. This result can be explained by teachers not being able to participate as observers in their colleagues' classes at the schools where they work. Learning communities or platforms where teachers can participate as observers in their colleagues' classes can be created to support reflective learning activities. Professional learning communities can be created and disseminated to increase teachers' sharing of their teaching practices. Since it has been found that teachers' awareness of and collaboration on their colleagues' teaching practices increase their professional learning, face-to-face or online platforms can be organized for teachers to share their teaching practices and experiences.

The professional learning score varies according to teachers' educational level. The reflective score and the average professional learning score of teachers educated at the associate degree level are higher than those of teachers educated at the bachelor's and graduate levels. According to this finding, teachers educated at the associate degree level are more involved in professional learning activities than teachers educated at the bachelor's and graduate levels. Furthermore, according to this finding, teachers educated at the associate degree level are more likely to engage in reflective learning activities, such as utilizing feedback from students and teachers to improve and change teaching strategies, observing the teachings of other teachers, and storing teaching-related data for later use, compared to teachers educated at the bachelor's and graduate levels. This finding can be interpreted as teachers educated at the associate degree level evaluating the professional learning activities they face more positively than their colleagues educated at the bachelor's and graduate levels and seeing them as an opportunity to increase their professional knowledge.

According to age, changes in teachers' school culture scores are as follows: teachers who are 35 years old or younger and 56 years old or older have higher scores in the teacher collaboration dimension of school culture than teachers between the ages of 36-45. Teachers who are 35 years old or younger have higher scores in the collaborative leadership dimension of school culture than teachers between the ages of 36-45 and 46-55.

The teacher collaboration and professional development scores in the dimensions of school culture differ according to teachers' education level. Teachers with an associate's degree have higher scores in the teacher collaboration and professional development dimensions of school culture than teachers with a bachelor's or higher degree. According to this finding, teachers with an associate's degree have a higher level of collaboration and professional development perception regarding the school culture they work in compared to teachers with a bachelor's or higher degree. Gruenert and Valentine (1998) state that in schools with opportunities for professional development, teachers have the chance to follow activities such as seminars, workshops, organization, and professional events that enable them to keep their knowledge of teaching practices up-to-date. In light of this information, it can be inferred that teachers with a bachelor's or higher degree may find their professional development opportunities in the school they work in less satisfactory and may have more professional development needs and expectations compared to teachers with an associate's degree. Organizations, workshops, and professional resources that can meet the professional development needs of teachers with bachelor's or higher degrees can be promoted in schools.

The school culture score of high school teachers is lower in all dimensions and average compared to primary and middle school teachers. The professional learning score of teachers varies according to the school level. The average professional learning score is lower for teachers working at the high school level compared to teachers

working at the elementary and middle school levels. In the reflection dimension, the professional learning score of teachers at the high school level is lower than that of teachers at the primary school level. In the application and knowledge base access dimensions, the professional learning score of high school teachers is lower compared to middle and primary school teachers. According to these findings, teachers working at the primary and middle school levels are more involved in professional learning activities than teachers working at the high school level. When this finding is evaluated together with the fact that the school culture score of high school teachers is lower than that of primary and middle school teachers, it can be concluded that high school teachers have lower involvement in professional learning activities compared to primary and middle school teachers.

When evaluated together with the finding that the school culture score of teachers working at high school level is lower than that of teachers working at primary and middle school levels, it can be attributed to the low level of professional learning in high school and the lower level of elements supporting vocational learning in school culture. The finding that the average school culture and average professional learning scores of teachers working at high school level are both lower than those of teachers working at middle and primary school levels is consistent with the findings of Kurşun's (2019) meta-analysis study, which identified a strong positive relationship between school culture and employee motivation and a moderate positive relationship between school culture and job satisfaction. It is also consistent with the finding of Ada and Ayık's (2013) study that a strong school culture is formed in primary schools.

The finding that the school culture and professional learning scores at high school level are both lower than those at primary and middle school levels can be interpreted as indicating that school culture directs teachers towards professional learning. According to Güçlü (2013), culture gives people emotions and intuitions about how to behave; organizational culture shapes the thoughts and behaviors of organizational members. This finding is also in line with Töremen's (2011) observation that when teams learn, the entire organization becomes a small universe for learning, and team success can determine the standard of collective learning for the entire organization. Similarly, Çelik (et al., 2021), suggests transforming schools into learning environments as a result of their research. Policies can be developed to support school culture and professional learning, given the low levels of school culture and professional learning at high school level. Since the positive effect of goal integrity on teachers' professional learning is observed, teachers can be enabled to strengthen their goal integrity by determining the goals they can achieve together. In high schools, school leaders can work on creating a common school mission and vision that teachers accept and determine common goals to contribute to goal integrity.

Due to this research, it was found that in elementary and middle schools where cooperation and goal integrity and average school culture score are higher than high school level, the professional learning score of teachers is also higher than that of high school level. This result supports the view that school culture is decisive in teachers' professional learning performance. Similarly, Cemaloğlu and Dolapçıoğlu's (2022) study found that cooperation is important for teacher professional learning and that cooperation among teachers is necessary for teacher professional learning. According to Ali (2017), a school's productivity level and its harmony are part of its culture. Newman and Wehlage (1995) argue that effective school culture leads to the formation of a professional learning community in which teachers work collaboratively toward goals to improve teaching and student learning. The findings of the research also align with the observation that culture has binding and integrative characteristics in organizational culture and that the importance of organizational culture in enhancing the quality of education in educational institutions is undeniable (Ölçüm, 1996).

Classroom teachers have a higher professional learning score in the application dimension than other teachers. According to this finding, classroom teachers develop alternative ideas, materials, and practices to improve teaching and solve teaching-related problems by giving more importance to professional learning activities, such as developing and using them in the classroom.

The school culture score of classroom teachers is higher than other teachers in all dimensions and on average. The determination that the application dimension of professional learning score and the school culture score of classroom teachers are higher than other teachers indicates that the elements supporting professional learning in the school culture dominant among classroom teachers are stronger than in other branches.

A positive and high-level relationship was found between school culture dimensions and professional learning dimensions. According to the current research results, there is a very strong significant relationship between teachers' professional learning and school culture. It has been observed that school culture is a predictor of professional learning. Among the school culture dimensions, teacher collaboration and goal coherence have a positive effect on professional learning, while collaborative leadership has a negative effect. Among the school

culture dimensions, collaboration and goal coherence positively predict teachers' professional learning, while collaborative leadership negatively predicts it.

It is possible to interpret this finding as teachers' constructive dialogue to strengthen their educational vision in school improves their professional learning. This finding can be interpreted as teachers' making teaching plans together, observing and exchanging ideas about their colleagues' teaching practices, evaluating teaching programs together with their colleagues, which are inherent in teacher collaboration, contributes to teachers' professional learning. According to the research findings, goal integrity is another element that positively contributes to teachers' professional learning. This result can be interpreted as when teachers strive to reach a common school mission, their professional learning improves.

Since it has been determined that teacher collaboration and goal integrity have a positive effect on teachers' professional learning, strategies can be developed to strengthen the elements that increase goal integrity and collaboration among teachers to improve their professional learning. A shared school vision that all teachers participate in can be determined to ensure goal integrity in schools. Especially at the high school level, where both school culture score and professional learning score are lower than other levels, strong school visions are needed to improve goal integrity.

Collaborative leadership is a component of school leadership that involves school leaders establishing and maintaining collaborative relationships with school personnel. Based on current research, it can be interpreted that while teachers collaborating with each other and finding solutions to their challenges primarily among themselves can enhance their professional learning, offering ready-made solutions to teachers by school leaders or expecting solutions from school management can have a negative impact on professional learning. Since collaborative leadership has been detected to have a negative effect on teachers' professional learning, strategies can be developed to facilitate the production of solutions among teachers through collaboration, instead of expecting solutions solely from school management when faced with problems. Brainstorming groups or teams can be formed among teachers for this purpose. Teachers can be involved in decision-making processes in schools by soliciting their opinions.

For further research, it is recommended to investigate other factors that may affect teachers' professional learning and the reasons for the low school culture score in high school level.

Declarations

Conflict of Interest

No potential conflicts of interest were disclosed by the authors concerning this article's research, authorship, or publication.

Ethics Approval

Yıldız Technical University Graduate School of Social Sciences granted the formal ethics approval.

Funding

No specific grant was given to this research by funding organizations in the public, commercial, or notfor-profit sectors.

Research and Publication Ethics Statement

The study was approved by the research team's university ethics committee of the Yıldız Technical University Graduate School of Social Scinces (Approval Number: 2209210427). Hereby, the authors, consciously assures that for the manuscript is fulfilled:

- This material is the author's original work, which has not been previously published elsewhere.
- The paper reflects the author's research and analysis in a truthful and complete manner.
- The results are appropriately placed in the context of prior and existing research.
- All sources used are properly disclosed.

Contribution Rates of Authors to the Article

The authors have contributed equally to this work.

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