

The Relationship Between Learning-Centered Leadership and Professional Learning: A Study on SAC Teachers

Öğrenme Merkezli Liderlik ve Mesleki Öğrenme İlişkisi: BİLSEM Öğretmenlerine Yönelik Bir Araştırma

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ABSTRACT: In this study, the relationship between principals' learning-centered leadership and teachers' professional learning was examined according to the views of Science and Art Center (SAC) teachers. Although similar studies have been carried out before, it was thought that SAC teachers' perceptions as a different context could provide important implications. 112 SAC teachers participated in the research. Data were analyzed with descriptive statistics, correlation analysis, simple and multiple linear regression analysis. In line with the findings, it can be said that SAC teachers have high perceptions of learning-centered leadership and professional learning. As a result of the research, it was concluded that learning-centered leadership predicted teachers' professional learning. The dimensions of learning-centered leadership, building a learning vision and providing learning support, are related to professional learning. However, the dimension of managing the learning program and modelling does not predict professional learning. These findings reached within the scope of the research were interpreted, and their similarities and differences with similar studies in the literature were discussed. Suggestions were made that SAC principals should go through a training process before starting their duties and that SAC principals should be granted autonomy.

Keywords: Learning-centered leadership, teacher professional learning, science and art centers, SAC.

ÖZ: Bu araştırmada BİLSEM (Bilim ve Sanat Merkezi) öğretmenlerinin görüşlerine göre müdürlerin öğrenme merkezli liderliği ile öğretmenlerin mesleki öğrenmesi arasındaki ilişki incelenmiştir. Daha önce benzer çalışmalar yapılmış olsa da farklı bir bağlam olarak BİLSEM öğretmenlerinin algılarının önemli çıkarımlar sağlayabileceği düşünülmüştür. Araştırmaya 112 BİLSEM öğretmeni katılmıştır. Veriler betimsel istatistikler, korelasyon analizi, basit ve çoklu doğrusal regresyon analizleri ile analiz edilmiştir. Bulgular doğrultusunda, BİLSEM öğretmenlerinin öğrenme merkezli liderlik ve mesleki öğrenme algılarının yüksek olduğu söylenebilir. Araştırma sonucunda, öğrenme merkezli liderliğin öğretmenlerin mesleki öğrenmesini yordadığı sonucuna ulaşılmıştır. Öğrenme merkezli liderliğin öğrenmeye dönük bir vizyon oluşturma ve öğrenme desteği sağlama boyutları, mesleki öğrenme ile ilişkilidir. Ancak öğrenme programını yönetme ve model olma boyutu, mesleki öğrenmeyi yordamamaktadır. Araştırma kapsamında ulaşılan bu bulgular yorumlanmış, literatürdeki benzer çalışmalarla benzerlik ve farklılıkları tartışılmıştır. BİLSEM müdürlerinin göreve başlamadan önce bir eğitim sürecinden geçmeleri, BİLSEM müdürlerine özerklik tanınması gibi önerilerde bulunulmuştur.

Anahtar kelimeler: Öğrenme merkezli liderlik, öğretmen mesleki öğrenmesi, bilim ve sanat merkezi, BİLSEM.

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There have been many changes in educational leadership together with the developments and changes in the leadership literature. Given this fact, today, educational leadership is seen as a process rather than an individual characteristic or an individual's behavior. In addition, leadership is considered an area of influence that includes interactions and relationships among people. It helps organizations/schools and individuals associated with the school achieve the desired educational leadership goals. This theoretical framework of leadership is based on the relations between the leader and the individuals in the organization (Murphy et al., 2006).

Since the 1980s, the role of school principals who had been titled as Wardman has evolved into an “instructional leader” (Fullan, 1992). Instructional leadership emerged with effective school research, is a leadership approach that includes providing students with knowledge and skills, applying the curriculum effectively, preparing a suitable working environment for teachers and administrators, and focusing on teaching processes (Sağır, 2015). Therefore, it can be mentioned that an instructional leader has responsibilities such as setting clear goals, organizing, and managing instruction to achieve these goals, being a resource provider, communicating at school, and being a visible person (Hallinger, 2007; Smith & Andrews, 1989). In this way, instructional leaders can raise the standards of teaching and learning at schools (Munna, 2022).

Effective instructional leadership aims to influence instruction directly. It also includes transformational behaviors influencing instruction in school indirectly via affecting school conditions, individuals at school and some other factors to increase student success in schools (Farnsworth et al., 2019). Robinson et al. (2008) concluded that school principals support for teachers’ professional learning and development plays an important role in influencing student learning. While other studies on the same topic also emphasize that student learning is the most important goal for school principals, they consider teachers' professional learning as an important factor in achieving this goal (Hallinger et al., 2017; Motoko & Liang, 2016). This approach, which makes a difference to traditional instructional leadership, examines how school principals can influence student learning. This new approach, including traditional instructional and transformational leadership elements, is conceptualized as learning-centered leadership (Farnsworth et al., 2019). In this way, learning-centered leadership is based on instructional and transformational leadership (Liu et al., 2016b). All these three leadership approaches argue that the main outcome of leadership in schools should be students’ learning (Hallinger et al., 2017). Instructional leadership focuses on how school principals improve student learning by supporting and activating teachers. On the other hand, transformational leadership is based on how leaders enable learning and change (Leithwood et al., 2010). In instructional leadership, the focus is more on teaching, not learning. Nevertheless, learning-centered leadership is based on the learning of all staff in the school. In this approach, principals are not only encouraging and controlling in the teaching process but also, they are leaders who contribute to the professional learning of teachers and learn themselves (Kılınç et al., 2017; Liu et al., 2016b).

Learning-Centered Leadership

The concept learning-centered leadership emerged in connection with instructional leadership and transformational leadership in the educational

administration literature is seen as a different leadership model today (Kılınç et al., 2017). Learning-centered leadership is an educational leadership model that aims to improve teaching and student learning by supporting the professional learning of school personnel, especially teachers. It is also a leadership style based on school organization and school culture, rooted in school development, and focusing on research and learning (Ertürk, 2022; Goldring, Huff, et al., 2009; Goldring et al., 2009).

A school principal's leadership skills and practices are affected by a number of factors. The previous experiences of the principal are one of them. Experience and knowledge gained over time can affect the expertise of the school principal. Moreover, the personal characteristics, values, and beliefs that they brought from their own life to the school environment may also affect these practices. In addition to this, teachers' efforts to improve their teaching and the principal's leadership practices are in mutual interaction. While all these affect the learning-centered leadership behaviors of the school principal directly, they also have some indirect effects. The experiences of teachers and school principals, teaching practices in their classrooms and students' learning are among the outputs of learning-centered leadership behaviors (Goldring et al., 2009; Murphy et al., 2006). To affect student achievement, school principals depend on teachers and other variables. In learning-centered leadership, it is aimed at affecting student success ensuring teachers' professional learning (Farnsworth et al., 2019).

Porter et al. (2008) expressed six basic components for learning-centered leadership, which they conceptualized as effective learning-centered instructional school leadership. These are setting high standards for student learning, preparing the curriculum scrupulously, effective teaching practices, learning culture and professionalism, linkages with stakeholders, and performance responsibility. In addition, six basic processes for learning-centered leadership related to these basic components and related with each other are discussed. These are planning, implementation, support, protection, communication, and monitoring (Goldring et al., 2009; Porter et al., 2008).

Liu et al. (2016a, 2016b) modeled learning-centered leadership in four dimensions: developing a learning vision, providing learning support, managing the learning program and being a model. The concept of developing a learning vision refers to the learning vision put forward by the leader to encourage learning and professional development at school (Kılınç et al., 2017; Liu et al., 2016a). Providing learning support means that the leader provides a suitable environment for learning together with the necessary resources/materials and support for the professional learning of teachers. In the learning program dimension, the leaders' designing the practices for the teachers' professional learning, their participation, their management, and their evaluation of the process are included. Finally, being a model is the other dimension which includes inspiring teachers by the school leader/principals' continuing their own professional learning and conveying the importance of continuous learning to them (Liu et al., 2016a).

Teacher Professional Learning

Educational reforms taking place in the world and in Türkiye have required teachers to adapt to changing classroom practices to achieve success for 21st-century students. Reforms in such an immense size have reached their peak level with the

pandemic and have made it necessary for teachers to update and develop themselves professionally. The most effective implementation of innovative approach practices in education remained dependent on teachers' professional learning. In other words, it can be said that a special importance should be given to teacher competence because teacher competence has a vital role in student learning. Hence, it will be very difficult for teachers to carry out the professional learning process without support and guidance (Ball & Cohen, 1999; Borko, 2004; Bouley et al., 2015).

Twenty years ago, the literature on teacher development focused primarily on pre-service, university-based teacher preparation, and in-service training. However, in the past 20 years, there has been a noticeable shift in thinking about the nature and effects of teacher learning in the workplace. Inspired by adult learning and situated learning theories, research and practice on teachers' professional learning are increasingly moving towards job-embedded, school-based, process-based, and inter-teacher collaborative learning (Drago-Severson, 2012; Geijsel et al., 2009; Liu et al., 2016a; Louis, 2006; Timperley, 2011; Thoonen et al., 2012). Therefore, teachers' professional learning is a dynamic, ongoing, and interactive process rather than a series of independent learning workshops where teachers are sent (Hallinger et al., 2019; Liu et al., 2017; Parise & Spillane, 2010). Given this point of view, school is a learning environment for both teachers and students. Recent studies in the literature tend to conceptualize school as a social vocational learning environment (Kwakman, 2003; Printy et al., 2009; Thoonen et al., 2012; Wang et al., 2005). Teachers' professional learning needs to be considered as a concept consisting of activities that take place individually and/or collectively in formal and informal settings. Therefore, the conceptualization of teacher professional learning used in the research includes both participation in "external courses and workshops" (in-service training, etc.) and teachers' "placed workplace learning at work."

According to Sparks and Loucks Horsley (1989), effective professional development practices include continuous development activities such as organizing development programs at school, helping each other teachers and school principals, focusing on individual teaching, and teachers' participation in line with their own goals. King (2016), on the other hand, proposed a framework for the professional development of teachers that includes baseline (e.g., self-evaluation, targets), degree and quality of change, systemic factors (e.g., support, teacher agency), learning outcomes and professional development experience.

Liu et al. (2016b) developed the Teacher Professional Learning Scale to measure to what extent and in which areas teachers have improved their learning to be more effective in their professions. The first dimension of the scale was conceptualized as collaboration. Collaboration dimension of professional learning aims to measure the extent to which each teacher cooperates with other teachers to plan instruction, improve teaching skills, share instructional activities, discuss, and evaluate student achievement. The second dimension of the scale is named "reflection." This dimension consists of items such as the teacher's using the feedback given by students and teachers, observing the teaching of other teachers, and saving the data related to teaching for later use to change and develop their teaching strategies. The third dimension is conceptualized as "experimentation". This dimension means that the teacher develops alternative ideas, materials and practices and applies them in the classroom to improve teaching and solve

teaching-related problems. The last dimension of the scale was defined as “reach out to the knowledge base.” This dimension aims to evaluate the extent to which teachers use different resources to improve their teaching (Hallinger et al., 2017; Liu et al., 2016b, 2017).

The Context of Science and Art Centers (SAC)

SAC is abbreviation of the science and art centers. The first one of these kinds of institutions in Türkiye was opened in Ankara in the 1994-1995 academic year named “Yasemin Karakaya Science and Art Center,” and the number of these centers is increasing day by day. Science and Art Centers were launched in various geographical regions of Türkiye. In 2022, the number has reached 355, and these centers have become ever increasingly widespread and new centers are also being constructed in more than one district of many provinces. The target number is 500 SAC in Türkiye in total.

Within the existing legal regulations, the main aim of Science and Art Centers Directive which is the only one that directly concerns the education and training activities of gifted children is to regulate the procedures and principles regarding the selection and training of teachers, principals, students and the establishment and operation of the science and art center in order to make aware of the individual abilities of gifted children/students in pre-school, primary and secondary education age.

Science and Art Centers are special education centers established to support the education of the gifted children. In the directive/regulation of Science and Art centers, being gifted is defined as the students who perform at a higher level than their peers in terms of intelligence, creativity, artistry, leadership capacity, or special academic (MoNE, 2016). Recommended by the World Health Organization and adopted by many researchers doing research in this field, Children with a 130-intelligence quotient (IQ) and above are defined as “gifted” (Uzun, 2004). Science and Art Centers undoubtedly are of great importance for the present and future of gifted and talented children, who comprise 2% of the population in developing their talents and using their capacities at the highest level.

Science and Art Centers (SAC) are founded by General Directorate of Special Education, Guidance and Counselling Services, Ministry of National Education (MoNE). Education model in Science and Art Centers differs from formal education. While elementary school students attempt to get a passing grade or prepare for exams, the organizational structure of Science and Art Centers does not include such objectives as getting good grades, passing a class, etc. Instead, education is carried out with a project-based model and students are expected to complete projects with required qualities (MoNE, 2018).

SAC teachers are selected through some performance criteria and the ranking made as a result of the exam. Principals are selected from SAC teachers who apply for the exam. As in the hierarchical education system in Türkiye, the boundaries of the duties of SAC principals are clearly defined. Principals have duties such as managing the institution in line with the legislation, monitoring the education processes and taking precautions, and submitting reports.

Theoretical Framework

In the learning-centered leadership researches that have intensified in recent years, it is seen that teachers' professional learning is focused on (Bellibaş & Gümüş, 2021; Hallinger et al., 2017; Hammad et al., 2021; Liu et al., 2016a; Talebizadeh et al., 2021). Liu et al. (2016a) determined that the learning-centered leadership of school principals has a direct impact on teachers' professional learning. It has been concluded that teacher trust plays a mediating role in this relationship and that trust is an important factor in the effectiveness of learning-centered leadership. In another study, Liu et al. (2016a) found that this relationship was mediated by teacher trust and teacher agency. Hallinger et al. (2017) found the positive effect of learning-centered leadership on teachers' professional learning. It has been determined that trust and teacher agency play a mediating role in this relationship.

Researchers stated that the connection between leadership and teacher agency triggers professional learning in a school where an environment of trust is provided. A study by Talebizadeh et al. (2021) concluded that learning-centered leadership directly and indirectly affects teachers' professional learning. It was found that this relationship was mediated by teacher trust and knowledge sharing. Similar to these studies, Hammad et al. (2021) revealed the effect of learning-centered leadership on professional learning. On the other hand, Bellibaş and Gümüş (2021) concluded that there is "surprisingly" no relationship between these two variables.

In the literature, the relationship between learning-centered leadership and some different variables has been examined recently. Reardon (2011) found that learning-centered leadership positively affects students' learning and principals' professional development. Bellibaş et al. (2020) concluded that learning-centered leadership has an effect on teacher leadership and this relationship is mediated by teacher agency. Kılınç et al. (2020) revealed in their studies that learning-centered leadership affects the change in teacher practices both directly and indirectly with the mediating effect of teacher collaboration. Özdemir et al. (2021) concluded that learning-centered leadership can affect student achievement through professional teacher community and parent involvement. Moreover, some other studies have revealed the relationship of learning-centered leadership with trust in the principal (Farnsworth et al., 2019) and learning school (Ertürk, 2022).

Although the relationship between learning-centered leadership and teacher professional learning has been proven in different countries, no relationship was found in the only study (Bellibaş & Gümüş, 2021) investigating this relationship in Türkiye. Therefore, it may be useful to investigate this relationship in a different sample in the context of Türkiye. In addition, investigating this relationship in Science and Art Centers, which have a different student and teacher profile and a different teaching structure, may contribute to the literature from a different perspective. Therefore, in this study, it was aimed to determine the relationship between the learning-centered leadership behaviors of SAC principals and the professional learning of teachers. For this, the following research questions were tried to be answered:

1. In the context of SAC, is there a significant relationship between principals' learning-centered leadership and teachers' professional learning?
2. In the context of SAC, are the dimensions of learning-centered leadership meaningful predictors of teachers' professional learning and its dimensions?

3. In the context of SAC, does learning-centered leadership significantly predict teachers' professional learning?

Method

Research Method

In this study, it was aimed to determine the relationship between learning-centered leadership and teachers' professional learning according to the perceptions of SAC teachers. In this respect, this study is correlational research. In correlational studies, the relationship between two or more variables or sets of scores examined (Creswell, 2012; Privitera, 2016).

Sample and Data Collection

The population of the research consists of teachers working in Science and Art Centers throughout Türkiye in the 2021-2022 academic year. The sample of the study was determined by the easy sampling method. In this direction, forms were sent to 200 SAC teachers from different cities in five regions of Türkiye. The data of the research were collected by sending online survey links to some participants via WhatsApp and by sending printed forms to some participants in May and June of 2022. 114 of these forms returned, and the responses of 112 participants were included in the study during the data analysis process. Of these participants, 61 (54.5%) were female and 51 (45.5%) were male. The experience of the participants in the teaching profession ranged from 1 to 35 years, with an average of 13.51 years. SAC experiences range from 1 to 8 years, with an average of 4.14 years. 100 (89.3%) of the participants are postgraduate, and 12 (10.7%) are undergraduates.

Data Collection Tools

The data of the research were collected with the Learning Centered Leadership Scale and the Teacher Professional Learning Scale.

Learning Centered Leadership Scale (LCLS)

Learning Centered Leadership Scale was developed by Liu et al. (2016b) to measure the learning-centered leadership behaviors of school principals and translated and adapted into Turkish by Kılınç et al. (2017). The original form of the scale consists of four dimensions with 25 items; these dimensions are building a learning vision, providing learning support, managing learning program and modeling. In the adaptation of the scale to Turkish, the number of items was reduced to 19 and the number of dimensions to 3 as a result of explanatory factor analysis (EFA). The dimensions of the scale are building a learning vision, providing learning support, managing the learning program, and modelling. Some of the items in the scale are as follows: "It provides the necessary support for teachers to carry out the learning vision." "It rewards teachers who participate in professional learning activities regularly." The dimension of building a learning vision explains 5.43% of the variance and the factor loadings of the items vary between .82 and .57. Providing learning support explains 54.11% of the variance and the factor loadings of the items vary between .76 and .57. Managing learning program, and modeling explains %5.95 of the variance and factor loadings vary between .78 and .58. The total variance explained by the three dimensions is 65.49%.

After explanatory factor analysis, confirmatory factor analysis (CFA) was applied to the data. Goodness of fit indices were found to be excellent, good, or acceptable as a result of CFA ($\chi^2=322.869$; $df=148$; $\chi^2/df=2.18$; RMSEA=.07; GFI=.88; AGFI=.84; CFI=.94). In addition, Cronbach's Alpha internal consistency values of the dimensions of the scale were calculated between .88 and .91 (Kılınç et al., 2017). The current study found Cronbach's Alpha internal consistency values between .92 and .96.

Teacher Professional Leadership Scale (TPLS)

Teacher Professional Learning Scale was developed by Liu et al. (2016b) to measure teachers' professional learning and translated/adapted into Turkish by Gümüş et al. (2018). The original form of the scale consists of collaboration, reflection, experiment, reach out to knowledge base dimensions. As a result of explanatory factor analysis (EFA), the structure of the scale (consisting of 27 items and 4 dimensions) was preserved in its Turkish version. As a result of confirmatory factor analysis (CFA), it was seen that the fit indices of the model were within acceptable ranges ($\chi^2=920.40$, $df=313$; $\chi^2/df=2.9$; RMSEA=.072; AGFI=.81; GFI=.85; NFI=.94; CFI=.96; SRMR=0.040; RMR=.061). Within the scope of reliability analysis, Cronbach's Alpha internal consistency value was found to be .92 for the total of the scale and between .77 and .85 for the dimensions of the scale. In the current study, Cronbach's Alpha internal consistency values were found between .93 and .96. Some sample items are as follows: "I work together with colleagues to plan educational activities.", "I record my teaching problems for learning purposes." and "I observe other teachers' lessons to learn."

The Procedures and Data Analysis

The data were transferred to the SPSS 26.0 program, and it was understood that there were no false and missing data. At first, the means and standard deviations of the variables were calculated. Then Mahalanobis distances were compared with the chi-squared distribution. The data of 2 participants which did not meet the $p<.001$ significance condition was excluded from the data set (Tabachnick & Fidell, 2019). The assumption of normality was tested first to determine whether the data are suitable for multiple linear regression analysis. For this, the skewness and kurtosis values of the variables were calculated. For learning-centered leadership, skewness is -.386, kurtosis is -.751. In its dimensions, skewness values are between -1.172 and -.490, kurtosis values are between -.721 and -.935. For teacher professional leadership, skewness is -.517, kurtosis is -.382. For its dimensions, skewness values range from -.402 to -.525, and kurtosis values range from -.374 to -.675. These values were determined to be in the range of -1.5 to +1.5. This proves that the data are distributed normally (Tabachnick & Fidell, 2019). Moreover, it was observed that the normal distribution was obtained by examining the Q-Q plot and histogram graph (Can, 2016). Then, it was determined that the relationship between the scatter diagram and each of the predictor variables and the predicted variable was linear. Multicollinearity occurs when the correlation between independent variables is greater than .90 (Tabachnick & Fidell, 2019). Pearson correlation coefficients between independent variables in this study ranged from .727 to .891. Another method for understanding multicollinearity is to examine the variance inflation factor (VIF) (Pituch & Stevens, 2016). A VIF value greater than 10 and a tolerance value less than .10 indicates a problem (Field, 2009; Myers, 1990). As a result of multiple linear regression analysis, VIF values were found between 2.840 and 6.508,

and tolerance values between .154 and .352. Another assumption of regression is independence of errors. Durbin-Watson statistics were used to examine the autocorrelation between errors. It is expected that this value should not be less than 1 and not greater than 3 (Field, 2009). In this study, the Durbin-Watson statistics were found between 1,550 and 1,896. Whether our sample size is sufficient or not is among the factors we consider. Green (1991) recommends the formula $104+k$ (number of predictors) after testing predictors one by one. In this case, our sample size exceeds 107, which is considered sufficient for our research. If the model is tested in general, it recommends the $50+8k$ formula. Our sample fulfills this requirement, too. In this way, it is understood that the assumptions for the multiple linear regression analysis are provided. After that, regression analyzes were performed with the enter method.

Ethical Procedures

This study received ethics approval from the Social and Human Sciences Scientific Research and Publication Ethics Committee of İnönü University (Dated 30.06.2022 and numbered E.196875).

Results

Pearson's product-moment correlation analysis was performed to determine the relationship between learning-centered leadership and the dimensions of teachers' professional learning. The results of the correlation analysis, arithmetic means and standard deviations of the variables are presented in Table 1.

Table 1

Descriptive Statistics and Correlations for Variables

Factors	1	2	3	4	5	6	7	8	9	M	SD
1. BLV	-									3.42	1.00
2. PLS	.81	-								3.40	1.04
3. MLPM	.73	.89	-							3.42	1.04
4. LCL	.88	.97	.95	-						3.41	.97
5. CO	.69	.66	.57	.68	-					3.65	.91
6. RE	.69	.67	.56	.67	.94	-				3.67	.92
7. EX	.63	.62	.54	.63	.89	.97	-			3.71	.93
8. RC	.69	.70	.59	.70	.84	.92	.89	-		3.75	.93
9. TPL	.70	.69	.58	.69	.95	.99	.97	.94	-	3.69	.89

* $p < .001$; $N=112$; (BLV: building a learning vision, PLS: providing learning support, MLPM: managing the learning program and modelling, LCL: learning-centered leadership; CO: collaboration, RE: reflection, EX: experiment, RC: reach out to knowledge base, TPL: teacher professional learning)

As it is seen in Table 1, the averages of the dimensions of learning-centered leadership are quite close to each other. It can be said that these averages show that teachers' views on learning-centered leadership are at a high level. Among the dimensions of teacher professional learning, the highest average was seen in “reached out to knowledge base” (RC; $M=3.75$), and the lowest average was seen in collaboration (CO; $M=3.65$) dimensions. It can be said that teachers' opinions are at a high level for TPL and its dimensions.

There is a significant and positive relationship at $p < .001$ level with all dimensions of learning-centered leadership and teachers' professional learning. A moderate positive correlation was found between "building a learning vision" dimension of learning centered leadership and CO ($r = .69, p < .001$); RE ($r = .69, p < .001$); EX ($r = .63, p < .001$) and RC ($r = .69, p < .001$) of professional learning. Likewise, a moderate and high positive correlation were established between learning-centered leadership's "providing learning support" dimension and CO ($r = .66, p < .001$), RE ($r = .67, p < .001$) EX ($r = .62, p < .001$) and RC ($r = .70, p < .001$). A moderate positive correlation was found between managing the learning program and modeling and CO ($r = .57, p < .001$), RE ($r = .56, p < .001$) EX ($r = .54, p < .001$) and RC ($r = .59, p < .001$). When the total scores were analyzed, it was seen that LCL and TPL showed a moderate correlation ($r = .69, p < .001$). The results of multiple linear regression analysis of LCL dimensions to predict TPL dimensions are given in Table 2.

Table 2

Multiple Linear Regression Results

Independent variables	Collaboration			Reflection			Experiment			Reach out to Knowledge Base			TPL		
	B	t	p	B	t	p	B	t	p	B	t	p	B	t	p
BLV	.382	3.673	.000	.404	3.932	.000	.352	3.115	.002	.349	3.421	.001	.377	3.850	.000
PLS	.374	2.457	.016	.443	2.949	.004	.366	2.211	.029	.481	3.224	.002	.422	2.942	.004
MLPM	-.096	-1.736	.463	-.187	-1.448	.151	-.096	-.676	.500	-.146	-1.143	.255	-.141	-1.144	.255
	F=36.640			F=39.128			F=27.622			F=41.809			F=41.858		
	p=.000			p=.000			p=.000			p=.000			p=.000		
	R ² =.491			R ² =.508			R ² =.418			R ² =.524			R ² =.538		

As is seen in Table 2, all three dimensions of learning-centered leadership significantly predict the collaboration dimension of professional learning ($F = 36.640, p < .05$). The three dimensions together account for 49.1% of the total variance of collaboration. While BLV and PLS are significant predictors of collaboration ($\beta = .419, p < .05$; $\beta = .425, p < .05$), MLPM does not significantly predict collaboration ($\beta = -.110, p > .05$). The three dimensions of learning-centered leadership explain 50.8% of the total variance in the reflection dimension. While BLV and PLS are significant predictors of reflection dimension ($\beta = .441, p < .05$; $\beta = .501, p < .05$), MLPM is not a significant predictor ($\beta = -.213, p > .05$). Given the dimensions experiment and reach out to knowledge base, it is seen that LCL dimensions explain 41.8% and 52.4% of total variances, respectively. It is understood that only MLPM is not a predictor for both dimensions ($\beta = -.108, p > .05$; $\beta = -.165, p > .05$). Given the teachers' professional learning as a whole, it was seen that LCL dimensions explained 53.8% of the total variance. It is established again here that MLPM was not a significant predictor ($\beta = -.165, p > .05$), while BLV and PLS were significant predictors ($\beta = .424, p < .05$; $\beta = .491, p < .05$). Finally, a simple linear regression analysis was conducted to determine whether learning-centered leadership predicts teachers' professional learning. The results regarding this are given in Table 3.

Table 3
The Regression Analysis Results

	Teacher Professional Learning (Total)		
	B	t	p
Learning Centered Leadership (Total)	.638	10.074	.000
	F=101.486		
	p=.000		
	R ² =.480		

As it is seen in Table 3, learning-centered leadership significantly predicts teachers' professional learning ($F=101.486$, $p<.05$). Learning-centered leadership explains 48% of the variance in professional learning. The regression equation reached is as follows: Teacher Professional Learning = 1.510 + 638 Learning-Centered Leadership. In this case, as teachers' perceptions of school principals' learning-centered leadership behaviors increase, teachers' professional learning also increases.

Discussion and Conclusion

In the education management literature, some evidence has been revealed that school leadership indirectly affects student achievement by influencing situations such as working conditions (Dutta & Sahney, 2022; Leithwood et al., 2010; Sebastian et al., 2017). School principals may adopt a leadership approach that integrates instructional leadership and transformational leadership so that their leadership can influence 'student' outcomes (Bellibaş et al., 2021). In this direction, learning-centered leadership, conceptualized as a combination of instructional and transformational leadership, is of great importance (Farnsworth et al., 2019). Studies revealed that learning-centered leadership affects teacher practices and student outcomes in the classroom (Kılınç et al., 2020; Özdemir et al., 2021; Reardon, 2011). According to Murphy et al. (2006), learning focused leadership is based on the fact that leadership is important, especially in difficult times for the organization.

Furthermore, this notion is based on the assumption that leadership is the most important factor explaining organizational performance. Leadership/ team leadership that focuses on teaching and change is promising for increasing organizational performance. With the scientific knowledge brought by the effective school movement, it has been revealed that school principals should be involved in the teaching and learning process at the classroom and school level (Tan, 2014). At this point, leadership practices are expected to improve conditions such as professional development of teachers. Teachers' developing effective teaching skills through professional development will facilitate the transition of the prepared curriculum to schools first and then to students. School principals undertake roles such as deciding on the professional development activities that teachers will participate in, providing budget and resources for professional development, and giving support and approval to some different development practices. Hence, school principals have an important role in the

professional development of teachers in terms of being a coach of learning (Tayag & Ayuyao, 2020).

Teachers and their professional development are important in the education of gifted children (Kontaş, 2009) as these teachers are involved in the teaching of students of different ages and characteristics, who have different needs/backgrounds. Therefore, teachers need to ensure their professional development to recognize their students' characteristics and carry out a qualified teaching process (NAGC, 2019). Our research has focused on teachers who need professional development most and teach gifted students in Science and Art Centers. In this study, it was aimed to determine whether SAC teachers' perceptions of school principals' learning-centered leadership predict teachers' professional learning.

Firstly, as a result of descriptive analysis, it was understood that teacher perceptions of learning-centered leadership and teachers' professional learning were at medium-high level. While these averages for learning-centered leadership are similar to some studies conducted in Türkiye (Ertürk, 2022; Kılınç et al., 2020; Özdemir et al., 2021), it is seen that higher averages have been reached in some other studies (Bellibaş & Gümüş, 2021). Some studies conducted abroad have averages close to this current study (Alazmi & Hammad, 2021; Hammad et al., 2021; Kulophas & Hallinger, 2020, 2021), there are also some other studies with higher averages (Al-Mahdy et al., 2021; Alfayez et al., 2021; Hallinger & Liu, 2016; Hallinger et al., 2017, 2019; Liu et al., 2016b; Talebizadeh et al., 2021). In the current study, the average scores for teachers' professional learning are higher than the ones for learning-centered leadership. It can be said that these values are lower than the results of many other studies (Al-Mahdy et al., 2021; Bellibaş & Gümüş, 2021; Hallinger & Liu, 2016; Hallinger et al., 2019; Kulophas & Hallinger, 2020, 2021; Liu et al., 2016b; Talebizadeh et al., 2021). It can be said that this result reached the first stage is due to differences between countries or differences in sampling. However, considering that many other studies in the literature were conducted in Eastern culture, not Western culture, there must be a different reason for the lower averages. We think that the reason for this result is the fact that research sample consists of SAC teachers. The fact that 89.3% of the teachers constituting the sample had a graduate degree may have increased their expectations. Therefore, their views regarding principals' leadership and professional learning may have been affected negatively. However, we could not perform a t-test due to the very small number of undergraduate teachers and we cannot provide empirical results to prove it.

Correlations between learning-centered leadership and teachers' professional learning were also examined in the present study. The two variables were moderately correlated in terms of total scores. Moderate and high correlations were also found between the dimensions of the two variables. It can be said that similar results have been found in the literature (Al-Mahdy et al., 2021; Hammad et al., 2021; Kılınç et al., 2020; Tayag & Ayuyao, 2020). Looking from the perspective of learning-centered leadership, the dimensions that have the lowest correlation with professional learning and its dimensions are the dimensions of managing the learning program and modeling. The experiment dimension showed the lowest correlation with learning-centered leadership and its dimensions.

The study also examined the effect of three dimensions of learning-centered leadership on professional learning. According to the results of the regression analysis,

the dimensions of building a learning vision and providing learning support predict teachers' professional learning and its dimensions. These results reveal the importance of creating a shared school vision for learning and creating a rewarding environment that encourages teacher development (Liu et al., 2016b). Leadership practices such as setting a clear vision in a centralized education system, providing the necessary resources and opportunities for learning, rewarding learning efforts and creating a supportive learning environment are of great importance in terms of professional learning (Hammad et al., 2021). The principal's inability to present a vision that is compatible with the teachers' goals and his goals may cause drawbacks in terms of learning (Kulophas & Hallinger, 2021). Furthermore, the fact that the principal does not encourage teachers to learn and do not support these activities financially and morally affects learning negatively.

The dimension "managing the learning program and modeling" did not have a significant effect on these relationships. Consistent with our research, Hammad et al. (2021) concluded that the dimension "managing the learning program and modeling" does not have a significant effect on professional learning. On the other hand, Liu et al. (2016b) revealed that the dimension "managing the learning program" has a small effect on TPL, while the modeling dimension has no effect. It can be said that this is similar to the results of the current research. The fact that the conclusions reached in these three studies, especially the one that the principals being a model for learning, do not affect TPL, should be considered. While the researchers stated that more research is needed to determine the reason for this, they declared stated some possible reasons. Accordingly, the strong hierarchical structures in China and Egypt may have caused the principals to want to keep a distance to avoid model behaviors in order to protect their authority. We can also consider this possibility for Türkiye, where there are strong hierarchical norms. In addition, different possible reasons can be explained in the context of SAC. For example, not having enough experience in the education of gifted children or working with many different branch teachers can hinder principals in managing the learning program and being a model.

Regression analysis results show that learning-centered leadership predict teachers' professional learning. The results of the study carried out by Hammad et al. (2021) also support this. Some studies with structural equation modeling also reveal the direct effect of LCL on TPL (Al-Mahdy et al., 2021; Hallinger & Liu, 2016; Hallinger et al., 2019; Huang et al., 2020; Kulophas & Hallinger, 2020; Liu et al., 2016b; Talebizadeh et al., 2021). These results obtained in our research and other studies reveal that the practices in which principals support and motivate professional learning have positive results. Practices such as putting forward a learning vision, providing feedback, encouraging participation in professional development activities enable teachers to be involved in professional development activities (Al-Mahdy et al., 2021; Huang et al., 2020; Kulophas & Hallinger, 2020).

Our results reveal the importance of principals as "learning leaders" for both students and teachers in the teachers' professional developments. Furthermore, potential possible outcomes such as student learning and school improvement can be achieved together with the teachers' professional development (Al-Mahdy et al., 2021). Studies correlating learning-centered leadership with student achievement also support this finding (Özdemir et al., 2021; Reardon, 2011). Moreover, some other studies in the

literature indicated that LCL has no direct effect on TPL and that the variables such as teacher trust and teacher agency mediated this relationship (Alazmi & Hammad, 2021; Bellibaş et al., 2020; Hallinger et al., 2017, 2019; Tayag & Ayuyao, 2020).

Implications

This study revealing that learning-centered leadership predicts the professional development of teachers contributes to studies conducted in different countries in terms of Türkiye population and sample. While doing this, it focuses on Science and Art Centers. In our research, we found that learning-centered leadership predicted the professional learning of SAC teachers. We have demonstrated that it is especially important to create a learning vision and to provide learning support. Hence, SAC principals need to present a vision that will motivate teachers to learn, provide the necessary resources for learning and support learning-oriented practices. It is also important to organize and manage learning practices, to inspire and model through their own professional learning. Although the school-based professional development model is stated in Türkiye, it is difficult to say that it has an equivalent in practice. However, school-based learning practices allow schools and teachers to carry out their learning activities in line with their own needs (Bellibaş & Gümüş, 2021). For this, we recommend providing the necessary resources to the schools and granting an autonomy to the principals, especially the SAC principals. In such a case, the school principal can develop a learning vision assuming the leader role in the learning-centered leadership and find an area of action that will encourage and support teachers to learn.

As we have stated, school principals need autonomy/freedom to support the development of teachers. However, we think that this is not enough in Türkiye, where the hierarchical structure in education system remains strictly. It may also be beneficial for principals to perceive supporting teacher development as a requirement in their professions. For this reason, clearer statements can be added to the job description of principals to support teachers' professional learning. SAC principals can be informed about this before and during their service (Kulophas & Hallinger, 2021). Our result that managing the learning program and being a model does not predict the professional learning of teachers, also supports this suggestion. We also recommend the professional development of SAC principals to manage the learning process and inspire learning. SAC principals, who manage a different institution due to the characteristics and needs of their students –the gifted ones- must undergo a training process before this task. This process should also include training on what teachers should do for their professional development. Thus, it can be ensured that SAC principals are learning-centered leaders, support, and model teachers in the learning process, manage learning and influence student success as a potential output.

We also study on some recommendations for researchers. In our research, we concluded that managing the learning program and being a model did not predict the professional learning of teachers. We suggest that future researchers who come to a similar conclusion should examine the reasons for this carrying out a mixed-method study. We think that the differences between SAC and other formal education can be revealed by conducting our study in the context of SAC in a more comprehensive way. We also add that qualitative or quantitative research can be conducted in the context of

Türkiye or in different countries to identify more variables that may mediate the LCL-TPL relationship and to test their mediations.

Limitations

One of the limitations of this study is the relatively low sample size of the research. The main cause of this is the fact that there is limited number of SAC and in connection with this fact there is also limited number of teachers working in these institutions. We explained in the method section that our sample size was sufficient for multiple regression analysis. However, as we mentioned in the discussion part, our sample size creates a limitation in cases such as determining the differences between undergraduate and graduate students. Finally, we can accept the fact that the data consists of teachers' opinions as a limitation. For this reason, it would be more useful to ask for the principals' opinions and especially to ask them to evaluate the professional learning of teachers instead of teachers evaluating their professional learning.

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Statement of Responsibility

Mahire Aslan; advising, design of the research process, review and editing, data collection. Erdener Arisoy; conceptualization, writing, methodology, data analysis, selection of data collection tools, design of the research process. Tuba Gören; conceptualization, writing-examination, data collection.

Conflicts of Interest

The authors declared no conflicts of interest with respect to the research, authorship, and/or publication of this article.

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