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Pre-service teachers' multidimensional leadership orientations: A PLS-SEM modelling*[1]

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Abstract

This research focuses on better understanding the nature of pre-service teachers' four-frame leadership orientations. As it is known, the phenomenon of leadership still continues to be a research topic in the field of educational administration. But these studies carried out on teachers and school administrators. As future teachers and school administrators, research on the leadership orientations of teacher candidates is less. Therefore, this study wants to investigate the multidimensional leadership orientations of teacher candidates and propose a model. The research is a quantitative relational survey study. Convenient sampling technique was used in the research. Participants n=278 [173 female; 105 male] are teacher candidates. At the end of the research; It revealed that the multi-directional leadership orientations of the teacher candidates were generally at a high level, but there was no significant difference in gender and grade level variables. On the other hand, it can said that the human resource leadership orientations of teacher candidates have a significant and small difference in favor of female teacher candidates (Glass'd=-.15; p<.05). Also, PLS-SEM structural model analysis revealed that pre-service teachers' human resource leadership and political leadership orientations predicted structural leadership tendencies with a significant partial mediation effect in the charismatic leadership dimension. Based on the findings of this study, teacher education and the development of four-frame leadership programs can be considered. As a result, teacher candidates' multifaceted leadership potential can be supported and developed.

Keywords: Four-frame leadership model, Leadership potential, PLS-SEM, Teacher training.

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INTRODUCTION

Teaching is an important profession for every society. Sustainability of education is possible when teachers can fulfil their professional roles in the best way (Hargreaves & Fullan, 2015). Among these roles, leadership ranks first in Turkey, as in many other countries. Teachers are sometimes the leaders responsible for running a school. Sometimes they lead for their class. In this context, determining the multi-faceted leadership orientations of teacher candidates in the teacher training process will be beneficial for the future of education. Thus, new insights may emerge in teacher education. As Holland, Eckert, and Allen (2014) point out, educational environments continue to change in the midst of many reforms. In this context, teachers needed to lead reforms to transform the profession and reshape education. But the role of the teacher in school and in the classroom also continues to change. Therefore, teacher education should continue to renew itself in this process of change.

For instance, Akman (2016), it is a fact that in today's information society, continuous changes and advances in information and communication technologies affect all areas of life as well as education systems. In this case, it is an important need for teachers to develop their leadership skills and specially to use technology. However, the primary way that teacher candidates can have these competencies expected from an average teacher is possible by increasing their leadership potential. Therefore, before technological competence, it is necessary to be sure of leadership potential. So, what does "leadership" mean in education and even educational administration?

Literature Review

Shoffner (2021) is almost certain that the concept of leadership is a encountered concept in education. He advocates the view that school administrators, teachers and teacher candidates are always expected to be good leaders. However, there are many and passionate definitions of leadership in the literature. This situation also causes confusion for the society. According to these definitions, leadership is having the capacity to bring people together for a common purpose, a strong character, and a set of behaviours that inspire others (Leithwood & Riehl, 2004). In other words, it is to motivate people to reveal their full potential to do better. And it related to inspiring them to read the signs so that a consensus can form. Hogan and Kaiser (2005) emphasize that social and organizational leadership is an important phenomenon in three important dimensions. The first of these dimensions is personality. Because personality helps predict leadership, and this information can used to improve the performance of current employees. The second is the result. Leadership has different characteristics that have real and positive results. Third is organizational performance. Leadership related to the performance of teams, groups and organizations.

In other words, studies on the leadership tendencies of teacher candidates can provide us with useful information on many subjects. For example, it is clear that teacher candidates with high leadership tendencies will contribute to the increase of organizational performance. Or, it may be possible to get the good results expected education and to predict how exemplary behaviour they will display with their personalities. In this context, Bolman and Deal (1991a) developed the four-frame leadership model. This leadership model; It consists of structural leadership, human resource leadership, political leadership and symbolic leadership sub-dimensions. Thanks to this model, it thought that it would be more concrete to understand organizations and the nature of leadership. According to this model; Structural leadership refers to high-level analytical thinking and organizing skills. Human resource leadership means creating a more supportive organizational climate and participatory environment.

On the other hand, political leadership more means balancing the power culture in the organization. Symbolic leadership is about having charismatic features and inspiring (Bolman & Deal, 1991b). For this reason, an individual with a structural leadership tendency expected to produce realistic solutions for the organization, while people with human resource leadership skills thought to be more inclined to cooperate (Bolman & Deal, 1991a). Also, individuals who are prone to political leadership can dominate

the power balances in the organization, while people who are prone to symbolic leadership can inspire other employees in the organization with their charismatic characteristics (Awamleh & Gardner, 1999). It can say that there are many national and international studies on Bolman and Deal's four-frame leadership model in the literature. For example, Thompson (2000) compared the four-frame leadership model with other leadership models. According to Sullivan (2001), it can say that this leadership model is still current. However, in the future, a name change may need in line with the needs of the age. Fidler (1997) claims that this model has a key role for school leadership. Koçak and Özdemir (2019) reported that there are many significant relationships at different levels between the four framework leadership models and collective teacher competencies.

While Snyder (2018) examines the relationships between the concept of educational leadership and the four-frame leadership model, Staub (2019) suggests that a link can established between the management of the accreditation process in higher education and the four-frame leadership model. In addition, with Bolman and Deal's leadership model, the communication process and motivational language in the organization (Holmes & Scull, 2019), change management at school (Ahmed, 2019; Reinholz & Apkarian, 2018) and organizational behavior (Heinrich et al. 2022; Suklun, 2020) There are many studies that have established significant relationships at different levels between.

The distribution of research topics related to the leadership orientations of pre-service teachers varies. The leadership orientations of teacher candidates and authentic leadership and organizational citizenship (Demirdağ, 2015); teacher leadership (Gündoğan & Kılıç, 2017; Xu & Patmor, 2012); critical thinking (Özdemir, Buyruk, & Güngör, 2018); creativity (Serce, 2017); professional development and career choice (Harms and Knobloch, 2005; Measure Dinçer and Seferoğlu, 2018); social problem-solving skills (Koç, 2018); classroom management skills (Atman, 2010); teaching performance (Korkmaz, 2005); emotional intelligence and academic success (Danley, Tye, & Loman, 2020; Yıldızbaş, 2017); "masculine" and "female" leadership (Oplatka, 2004); learning styles (Arslan & Uslu, 2014b); It seen that there is a significant relationship between 21st century teacher skills (Korucu & Ünüvar, 2020; Sherrill, 1999) and cultural sensitivity (Hu & Szente, 2009; Samuels, Samuels & Cook, 2017).

In some national studies, the relationships between pre-service teachers' leadership orientation levels and independent and various variables such as gender, grade level, number of siblings and registered teaching program were also tested (Arslan & Uslu, 2014a; Cengiz & Güllü, 2018; Çetinkaya & İmamoğlu, 2018; Durukan et al. 2006; Güngör & Yenel, 2017; Sarıkaya & Bilir, 2019; Sezer & Kahraman, 2018). According to Bond (2011) teachers should not expect to gain professional skills through experience. Instead, they can devote more time to acquiring the knowledge, skills, and dispositions of teacher leaders in the pre-service teacher training process. It is important that this suggestion taken into account by teacher candidates. However, it is clear that for this recommendation to be effective, leadership programs in teacher education will needed more. There are different models in the literature for these leadership programs. For example, Matsumoto, Yoshioka, and Fulton (2018) argue that a professional development school should be among the leadership models for teacher education. According to them, the units to established within the scope of this model and the institutions/faculties that train teachers should work together. It is possible to see these units as incubation centers for teacher candidates.

Thus, teacher candidates can prepared not only to teach in the classroom, but also to seek leadership opportunities based on their passions. Another prominent model in this regard is the collaborative leadership model (Keiser, Kincaid & Servais, 2011; Romero & Romero, 2018). The collaborative leadership model is a model in which pre-service teachers have the opportunity to work with many stakeholders during the education process. The educational process ceases to focused on acquiring knowledge. Teacher candidates can explore their own leadership orientations by participating in many and direct activities.

Importance of Research

Research on the leadership potential of teachers is still ongoing. However, the number of studies on the leadership potential of teacher candidates is less. This study examines the leadership potentials of teacher candidates with the PLS-SEM (Partial Least Squares Structural Equation Modeling) approach. For this reason, it is thought that the study has a unique value as a research in which the PLS-SEM approach is used. In addition, it has the power to be an important resource in the development of new models to be produced regarding the leadership potential of teacher candidates.

Research Questions

The purpose of this research is to both reveal the four-frame leadership orientations of pre-service teachers and to suggest an alternative way for the effectiveness of the model. The sub-problems of the research given below:

- What is the level of pre-service teachers' perceptions of four-frame leadership?
- Is there a significant difference between the leadership orientations of teacher candidates with gender and grade level?
- Is there structural validity of the measurement model created for the relationship between pre-service teachers' four-frame leadership orientation and its sub-dimensions?
- If the measurement model of the study has structural validity, what are the mediating relationships between the dimensions of the research model?

METHOD

Firstly, this research is a cross-sectional and correlational survey study. Because, based on the four-frame leadership model, it is aimed to explore the leadership orientation perception levels of teacher candidates and the relationships between them. According to Hall (2008), a cross-sectional survey collects data to draw conclusions about a population (the universe) of interest at a given time. Cross-sectional surveys were called "snapshots" of the populations studied. Apuke (2017) defines correlation research as a quantitative method used to determine whether and to what extent there is a relationship between two or more variables in a population (or a sample). Secondly, it is aimed to propose an alternative model for the relationships between these discovered leadership orientations. Therefore, Structural equation modelling (SEM) used. In this context, this study uses a Structural Equation Model (SEM) to measure the relationships between political leadership, charismatic leadership, human-resource leadership and structural leadership in prospective teachers.

SEM is a suitable and adaptable technique for assessing model constructs as well as hypothesized structural relationships among variables using a measurement model and structural model analysis (Durdyev et al. 2018; Hair et al. 2014). In the literature, there are two methods for SEM: CB-SEM and PLS-SEM. While CB-SEM is based on the calculation of maximum likelihood and covariance, PLS-SEM performs analysis based on variance. Also, the sampling sensitivity of CB-SEM is quite high. On the other hand, PLS-SEM has the potential to give good results with smaller samples (Polat, 2018). Therefore, PLS-SEM path analysis approach was adopted in this study. The main purpose here is to test an alternative model based on Bolman and Deal's four-frame leadership model. The research measurement model created for this purpose is given in Figure 1.

Theoretical Framework

According to the measurement model of the research (Figure 1), it can be said that there may be a direct relationship between the Political Leadership, Charismatic Leadership and Human-Resource Leadership orientations of pre-service teachers with their Structural Leadership orientations. Besides, it is suggested that political leadership and human resource leadership orientations can predict structural leadership through charismatic leadership. This claim means that there may be some regulatory or mediating relations between the leadership orientations of the participants.

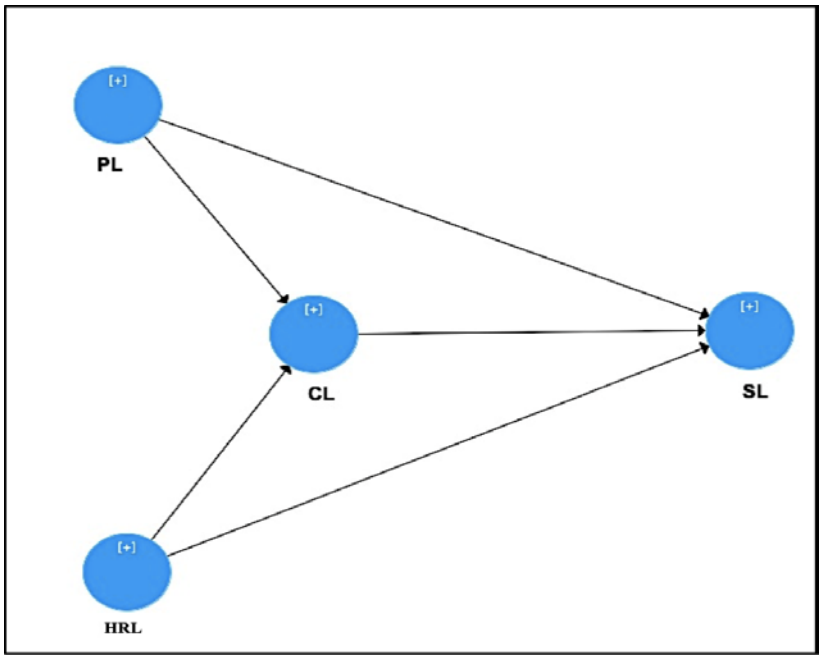

Figure 1. The Measurement Model Determined for The Study [Political Leadership (PL), Charismatic Leadership (CL), Human-Resource Leadership (HRL) and Structural Leadership (SL)]

Participants

The study group of the research consists of n=278 teacher candidates determined by convenience sampling. Convenience sampling is a type of nonprobability or nonrandom sampling in which members of the target population who meet certain practical criteria such as easy accessibility geographical proximity availability at a given time or willingness to participate are included in the study. Captive participants, such as students at the researcher's own institution, are prime examples of convenience sampling (Etikan, Musa & Alkassim, 2016). This, also, study was carried out with the students that the researcher taught at the education faculty of a state university in eastern Turkey. About half of the participant group consisted of third year students [~50%; n_3=138]. The lowest attendance was for second-year students [~16%; n_2=44]. Female teacher candidates were more willing to participate in the research [~62%; n_f=173]. The main reason for this situation may be that female teacher candidates represent a large part of the total student population in the education faculty.

Data Collection Tool

A personal information form and a five-point Likert scale with four sub-dimensions were used to collect data. In the personal information form, pre-service teachers were asked about their gender and grade levels. The "Multidimensional Leadership Orientations" scale used in the research was developed by Dursun, Günay and Yenel (2019). The reason for choosing this scale is that it is a scale that is frequently used in the national literature and its language is understandable. During the scale development process, Exploratory and Confirmatory Factor Analysis was performed by the researchers. The scale consists of 19 items and four sub-dimensions (political leadership, human resource leadership, charismatic leadership and structural leadership). The calculated Cronbach Alpha value of the scale is .85. The scale and its sub-dimensions together have good goodness-of-fit values (χ^2/df=2.72, CFI=.96, GFI=.82, AGFI=.86, RMSEA=.06, NFI= .93, SRMR=.48). The answers given to the items in the scale form were structured as "1=Strongly Disagree", "2=Agree", "3=Undecided", "4=Agree", "5=Strongly Agree" (Dursun, Günay & Yenel, 2019). The reliability analyzes conducted within the scope of this study also confirm the reliability of the scale (McDonald's ω=.89; Cronbach's α=.88). In addition, second order confirmatory factor analysis (CFA) applied to the scale (Figure 2). The scale and its sub-dimensions

together have good goodness-of-fit values (χ^2/df=2.34, CFI=.90, GFI=.90, AGFI=.89, RMSEA=.07, NFI=.83, SRMR=.06).

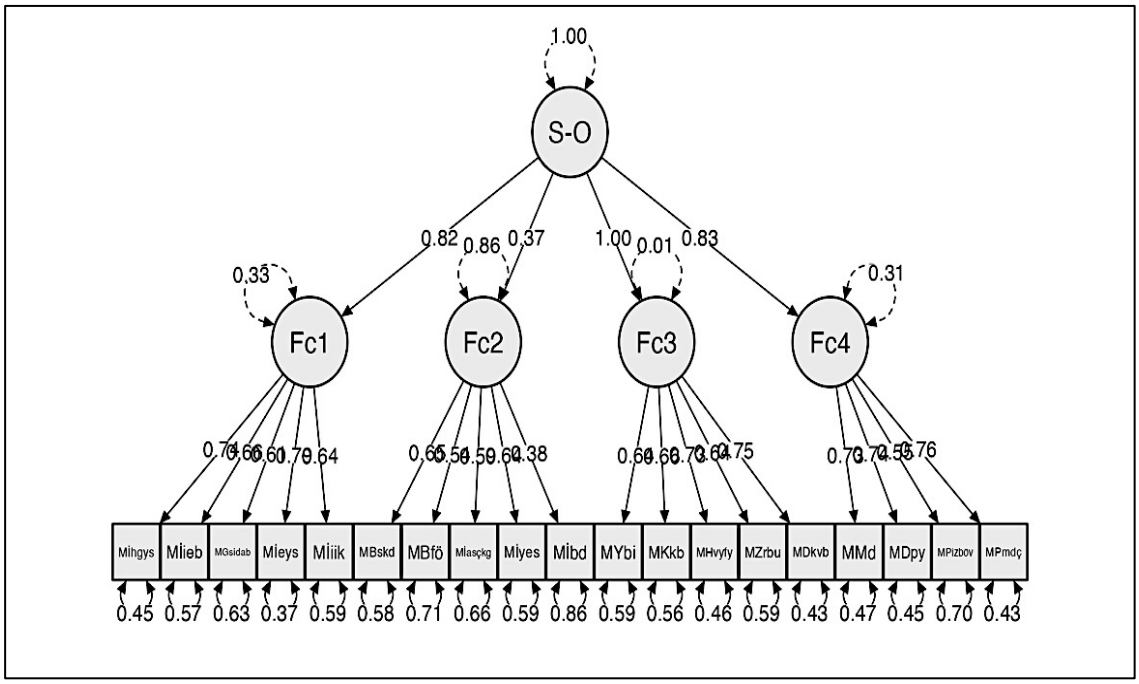

Figure 2. Second Order Confirmatory Factor Analysis (CFA) Result [S-O: Multidimensional Leadership Orientations, Fc1: Political Leadership (PL), Fc2: Human Resource Leadership (HRL), Fc3: Charismatic Leadership (CL), and Fc4: Structural Leadership (SL)

Process

Research data were collected in the academic year 2021-22. First, an online data collection form was prepared for the application via Google Forms. Later, this form was sent to pre-service teachers via Google Classroom as a data collection tool. The total number of pre-service teachers to whom the data collection tool was sent is 330. Of the submitted forms, 278 were filled. In other words, the return rate of the data collection tool is ~84%. In the process of collecting the research data, teacher candidates were reminded twice at different time intervals through the Google Classroom. The process of collecting all the data took about a month.

Data Analysis

While interpreting the Likert scale items in the study, the .80 value calculated as the mean score range was taken as the basis [score range=(highest value-lowest value)/5 ⇒ 4/5=0.80]. For example, scale scores with an average scale score between 1.00-1.80 or 1.80-2.60 mean that teacher candidates have low leadership orientation. The range of 2.60-3.40 indicates a medium level, and the range of 4.20-5.00 indicates a high level of leadership orientation. Next, JASP (Version 0.16.1) and SmartPLS computer software were used for advanced data analysis.

First, descriptive statistics, normality tests, independent sample t-test, One-Way ANOVA, Mann-Whitney U and Kruskal-Wallis H tests and effect size analyzes such as Glass' delta were performed on the data (Fritz, Morris & Richler, 2012). Secondly, structural validity and reliability analyzes were performed for the measurement model of the research. Both measurement and structural model analyzes must be performed, especially in research based on the PLS-SEM approach. Therefore, for the validity and reliability of the model; Factor loading values of the measurement model, average variance extracted (AVE), composite reliability (CR), Cronbach Alpha (CA), rho_A, Fornell-Larcker, HTMT and t-statistical analyzes should be performed. For the structural model of the study, standardized factor loading values

and VIF findings should be reported (Ghasemy et al. 2020). Then, the bootstrapping method was applied on the structural model (N=5000). The results are reported in the findings section ($p<.05$).

Ethics Statement

This research was carried out with the permission of Muş Alparslan University Scientific Research and Publication Ethics Committee (26.11.2021-30765).

RESULTS

In this section, the findings obtained after the data analysis are shared together with the sub-problems of the research.

Findings Regarding the First Sub-Problem

The details of the descriptive statistics for pre-service teachers' four-frame leadership orientations are shared in Figure 3 and Table 1.

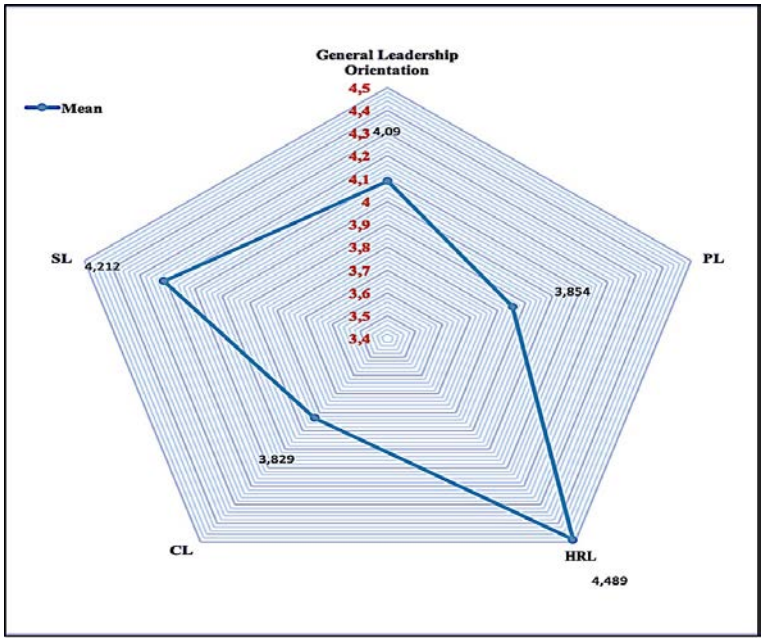

Figure 3. The Nature of Pre-Service Teachers' Four-Frame Leadership Orientations

Table 1. Descriptive Analysis of Participants' Scale Scores

	General level of Leadership Orientation (GLO)	Political Leadership (PL)	Human Resource Leadership (HRL)	Charismatic Leadership (CL)	Structural Leadership (SL)
Mean	4.09	3.85	4.49	3.83	4.21
SEM	0.03	0.04	0.03	0.04	0.04
SD	0.50	0.67	0.47	0.73	0.66
Skewness	-0.50	-0.60	-1.00	-0.43	-0.85
Kurtosis	0.16	0.30	0.48	-0.22	0.71
Range	2.53	3.20	2.00	3.60	3.50
n=278					

When Table 1 and Figure 3 are examined together, it is seen that the four-frame leadership orientations of teacher candidates are generally at a high level (Mean=4.09; SD=.50). When the sub-dimensions of the model are compared with each other, it can be said that the participants have the highest level of

human resource leadership orientation (Mean=4.49; SD=.47). This is followed by structural leadership, political leadership and charismatic leadership, respectively (Mean=4.21; SD=.66, Mean=3.85; SD=.67, Mean=3.83; SD=.73). These findings state that pre-service teachers have a high level four-frame leadership potential.

Findings Regarding the Second Sub-Problem

Firstly, independent sample t-test and One-Way ANOVA analyzes were performed. In general, it was found that the difference between the gender and grade level variables of the pre-service teachers and the total scores of the four-frame leadership orientation was not significant (p>.05). On the other hand, it was understood that the sub-dimensions of the scale did not show a homogeneous distribution. It can be said that the pre-service teachers' views on the sub-dimensions of the scale do not show a normal distribution. For this reason, Mann-Whitney U and Kruskal-Wallis H non-parametric tests were applied for the sub-dimensions of the scale. In terms of sub-dimensions of the scale, although the difference between teacher candidates' grade level variable and leadership orientations is not significant, the difference between gender and human resource leadership sub-dimension is calculated to be significant. However, the effect of this difference is small (Figure 4; U=7699.50; p=.03<.05).

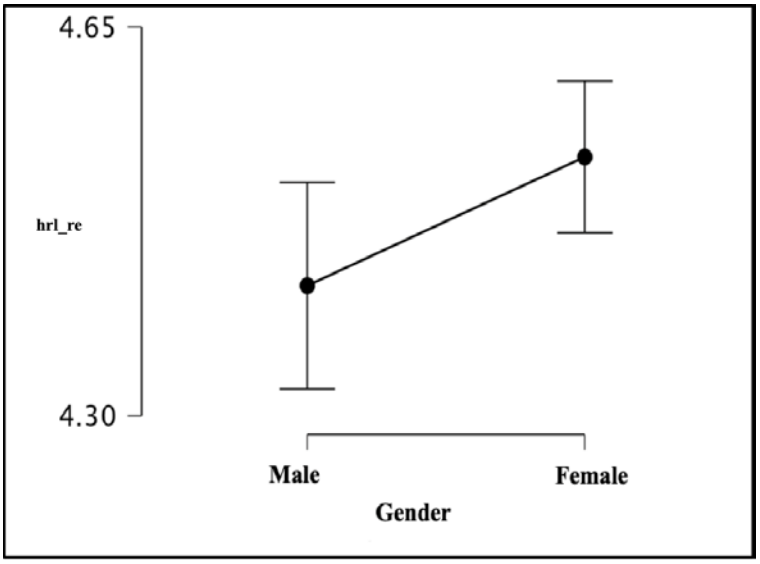

Figure 4. The Relationship between The Gender of The Participants and Their Human Resource Leadership Orientation

Looking at Figure 4, it is seen that the significant difference is in favor of female participants. The human resource leadership orientations of female teacher candidates (Mean=4.53; SD=.46) differ significantly and at a higher level than male participants (Mean=4.42; SD=.48). However, it can be said that the significant difference between the human resource leadership orientations of men and women effect size is not very large (Glass'd=-.15; p<.05).

Findings Regarding the Third Sub-Problem

Before the validity analyzes of the measurement model created within the scope of the research, Confirmatory Tetrad Analysis was performed for the model. Thanks to this analysis, it was decided whether the model was reflective or formative (Çakır, 2019). All CI up and CI low values obtained after the analysis were compared with each other, and it was seen that the model was a reflective model. Thus, the type of measurement model was determined. The next step was taken to test the convergent and divergent validity of the measurement model.

Foremost, t-test statistics for each item in the scale were examined (>1.96). Then, items with valid indicator coefficients (>.70) were determined for each sub-dimension of the scale. Then, the average

values of valid indicator coefficient loads were calculated (>.70). For each sub-dimension of the scale, the Average Variance Extracted (AVE) values were evaluated (>.50). Then, composite reliability (CR), Cronbach Alpha (CA) and rho_A values obtained for the model were analyzed (>.70). In addition, Fornell-Larcker, HTMT and latent variable correlation values were compared with each other for the measurement model.

All the findings obtained from the analyses on the validity and reliability of the measurement model determined for the four-frame leadership orientation sub-dimensions of pre-service teachers are summarized in Table 2 and Table 3. Looking at Table 2, it can be said that the Fornell-Larcker, HTMT and latent variable correlation values calculated for the measurement model are in the appropriate ranges for PLS-SEM studies. It is seen that Fornell-Larcker values are in the range of .72-.80 and are higher than all the correlation values (.27-.68) of the latent variables in the columns and rows they are in. Besides, it can be stated that the HTMT values of the measurement model vary between .34-.84. The first findings of the measurement model of the study say that there is a good agreement between the sub-dimensions of the model in general (Franke & Sarstedt, 2019; Fornell & Larcker, 1981; Henseler, Ringle & Sarstedt, 2015).

When Table 3 is examined, it is seen that the preconditions for convergent and discriminant validity for the measurement model of the research are mostly met. However, especially in discriminant validity, one of the original scale items (hbl_m10) was excluded from the model because it did not have sufficient indicator coefficient (>.704). It can be stated that the calculated AVE, CR, rho_A and Cronbach Alpha values indicate an acceptable and good fit for the discriminant validity of the measurement model (AVE>.50; CR, rho_A, CA>.70). Thus, for the structural model obtained at the end of the analysis of the measurement model, 2nd level Confirmatory Factor Analysis (DFA) was performed by means of the Partial Least Square (PLS) method. The t-statistic, standardized factor loads and VIF values obtained at the end of the analysis of the structural model also show that there is a generally acceptable model fit in the context of the PLS-SEM literature (SRMR=.08; Chi-Square (X^2) =371.91; NFI=.72 ; d_ULS=1.10; d_G=.37).

Table 2. Fornell-Larcker, HTMT and Latent Variable Correlation Values of The Measurement Model

	HRL	**CL**	**PL**	**SL**
HRL	.72			
CL	.31 (.39)	.75		
PL	.27 (.34)	.68 (.84)	.76	
SL	.29 (.39)	.64 (.79)	.56 (.70)	.78

Table 3. Summary of PLS-SEM Analyzes for Validity and Reliability Levels of The Measurement Model Determined for Pre-Service Teachers' Four-Frame Leadership Orientations

Structural model measurement criteria	**HRL**	**CL**	**PL**	**SL**	**Comments for measurement model fit**
1. Validity of the measurement model					
1.1. Convergent Validity					
t-Statistically significant items (>1.96)	m6, m7, m8, m9, m10	m11, m12, m13, m14, m15	m1, m2, m3, m4, m5	m16, m17, m18, m19	At this stage, there are 19 items that are compatible with the original scale.
1.2. Discriminant Validity					
Items with valid indicator coefficient (>=.60)	m6 (.68), m7 (.60), m8 (.79), m9 (.77)	m11 (.72), m12 (.72), m13 (.82), m14 (.71), m15 (.76)	m1 (.80), m2 (.75), m3 (.71), m4 (.80), m5 (.71)	m16 (.83), m17 (.80), m18 (.63), m19 (.82)	Of the 19 items above, 18 showed significant discriminant validity.

Current indicator coefficient load value averages	.71	.75	.75	.77	Loading coefficients to the environment>.70 support discriminant validity of the scale's dimensions (Hair et al. 2010).
Average Variance Extracted (AVE)	.51	.56	.57	.60	AVE>.50 (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Hair et al. 2017).
Composite Reliability (CR)	.81	.86	.87	.86	CR>.70 (Hair et al. 2014; Nunnally & Bernstein, 1994)
Cronbach Alpha (CA)	.68	.80	.81	.78	CA>.70 (Tavakol & Dennick, 2011).
rho_A	.71	.81	.81	.80	rho_A>.70 (Çakır, 2019).

2. Validity of the structural model*					
	HRL→CL	HRL→SL	CL→SL	PL→CL	PL→SL
2.1. Standardized factor loading values	.14	.15	.47	.64	.52
2.2. t-Statistics (>1.96)	2.44(.02**)	2.09(.04**)	6.24(***)	13.37(***)	9.41(***)
2.3. VIF	1.08	1.12	1.92	1.08	1.87

*SRMR=.08; Chi-Square (X^2) =371.91; NFI=.72; d_ULS=1.10; d_G=.37, **p<.05; ***p<.001
Note: All path coefficients were statistically significant (p<.05). This finding supports the relationship between each sub-dimension and the whole model. (Çakır, 2019; Polat, 2018). VIF<5.00 (Hair et al. 2019).

Findings Regarding the Fourth Sub-Problem

At the end of the validity analyses for the measurement model of the research, it was revealed that the model had an acceptable structural validity. For this reason, Bootstrapping analysis was used to explore the relationship between the four-frame leadership model sub-dimensions in the structural model of the research. Figure 5 and Table 4 can be consulted for the findings.

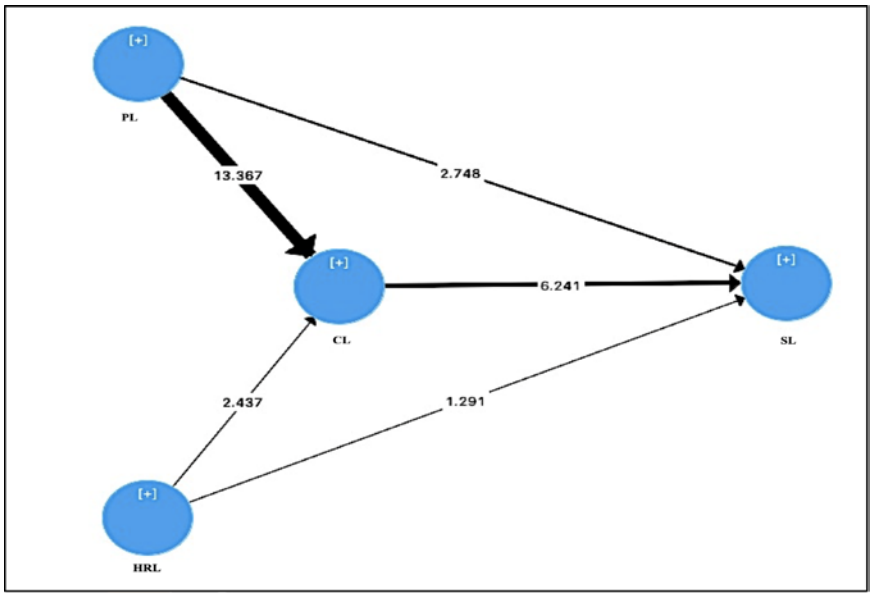

Figure 5. Bootstrapping Analysis Screen Output for The Structural Model of The Research (N=5000)

In the last stage of the findings, the significant mediating effects revealed by the structural model of the research are given in Table 4. Variance Account For (VAF) values suggested by Nitzl, Roldan, and Cepeda (2016) were used as a method in the process of determining the mediating effects for the structural model. These values were calculated with the formula VAF=axb/axb+ c'.

While interpreting the obtained VAF results, Hair et al. (2016) suggested ranges were accepted. Accordingly, if the achieved VAF value is less than 20%, this means a zero-mediating effect. A value in the range of 20%-80% indicates a partial mediating effect, and a value higher than 80% indicates a complete mediating effect. In this respect, it has been revealed that there are some significant and partial mediating effects between the four-frame leadership dimensions in the structural model. In other words, the achieved VAF values are; It can be interpreted that charismatic leadership orientations have a partial mediator role, varying between 32% and 37%, on the significant relationship between pre-service teachers' human resource leadership and political leadership orientations and structural leadership orientations.

In Figure 5, a program screen output that belongs to the model, which is reached at the end of the Bootstrapping analysis for the structural model, is seen. It can be said that there are highly significant relationships between the sub-dimensions of the research model and the whole structural model (T>1.96; p<.05).

Table 4. Findings on The Analysis of Mediating Effects in The Structural Model

Paths	Path Coef. (a)	Path Coef. (b)	(a)x(b)	T	p	VAF
HRL→CL→SL	.14	.47	.07	2.33	.02**	.32 (%32)
PL→CL→SL	.64	.47	.30	5.22	***	.37 (%37)

**p<.05; ***p<.001

DISCUSSION AND CONCLUSION

In this research, it aimed to reveal the multidimensional leadership orientations of teacher candidates within the framework of Bolman and Deal's four-frame leadership model. Then, using the PLS-SEM approach over an alternative model, it desired to explore the nature of the multi-faceted leadership orientations of pre-service teachers.

The first finding is that pre-service teachers' multidimensional leadership orientations are generally at a high level. In other words, it can say that the participants have a high level of leadership orientation the four-frame leadership model. Some studies in the national literature also support this finding (Arslan & Uslu, 2014a; Cansoy & Tofur, 2017; Çetinkaya & İmamoğlu, 2018; Sezer & Kahraman, 2018). However, Dinçer and Seferoğlu (2018) stated that the high leadership orientation of teacher candidates does not mean that they will always be willing to be leaders.

According to Harms and Knobloch (2005), the decisive feature at this point is whether pre-service teachers want to be a teacher as a career. Because it has revealed that teacher candidates who see teaching as a career are more competent and willing than others. Garipağaoğlu and Güloğlu (2015) also stated that pre-service teachers who chose teaching had higher self-leadership skills than others.

In the study, it determined that the highest leadership orientation among teacher candidates was in the dimension of human resource leadership. This finding is also supported by the research results of Cansoy and Tofur (2017) and Arslan and Uslu (2014a). Arslan and Uslu (2014a) are of the opinion that this situation experienced because pre-service teachers do not encounter problems that need different kinds of solutions throughout their lives.

In other words, the fact that the problems that pre-service teachers encounter in their learning environments based on human relations may have led them to choose the human resource leadership dimension. Therefore, it is natural for teacher candidates to have high human resource leadership orientations. On the other hand, it understood that the structural, political and charismatic leadership orientations of the participants are close to each other and at very high levels.

Secondly, no significant difference found between pre-service teachers' multidimensional leadership orientations and their genders in general. However, it can said that female teacher candidates' human resource leadership orientations are more significant and at a higher level than males. At this point, although the leadership orientations of female and male teacher candidates are quite close to each other and at a high level, it understood that female teacher candidates have more human resource leadership orientation. So, it can say that the fact that the multidimensional leadership orientations of teacher candidates do not change gender variable is compatible with the relevant literature (Arslan & Uslu, 2014b; Cengiz & Güllü, 2018; Özdemir et al. 2018). However, the fact that the difference between the human resource leadership orientation dimension and the gender variable is in favor of female teacher candidates does not coincide with the findings of Çetinkaya and İmamoğlu (2018) and Serçe (2017). According to Serçe (2017), the leadership orientations of teacher candidates generally show a significant difference in favor of male candidates. Also, for example, this significant difference is in the sub-dimension of political leadership.

Another important finding is that there was no significant difference between pre-service teachers' four-frame leadership orientations and grade levels. But, as the grade level increased, it predicted that the difference between the leadership orientation levels of the participants would increase significantly. But, it revealed that the increase in grade level did not have any significant effect on the leadership orientations of teacher candidates.

The third finding belongs to the measurement model of the research. The validity of the four-frame leadership measurement model, which determined for the multidimensional leadership orientations of teacher candidates, tested. Accordingly, it can say that the convergent and divergent validity of the measurement model is acceptable and at a good level. Although the NFI value obtained for the model fit indices was low, it observed that especially the SRMR value showed acceptable model fit.

At the end of the analysis, it determined that the mean loads of valid indicator values and AVE, CR, Cronbach Alpha and rho_A values were between the ranges specified in the literature (Bagozzi & Yi, 1988; Çakır, 2019; Fornell & Larcker, 1981; Hair et al. 2010; Hair et al. 2014; Hair et al. 2017; Nunnally & Bernstein, 1994; Tavakol & Dennick, 2011). In addition, it understood that the standardized load values, T-test and VIF values calculated to test the structural fit of the measurement model also state good structural fit (Hair et al. 2019; Polat, 2018).

Therefore, it can state that the measurement model of the research is a valid model. According to the results, it has revealed that the relationships between human resource leadership and charismatic and structural leadership are significant. Moreover, the relationships between political leadership and charismatic and structural leadership are also significant. The charismatic leadership orientations of teacher candidates related to their structural leadership levels.

Finally, Bootstrapping analysis performed for the measurement model of the research. At the end of the analysis, the values reached found to be significant. In this context, it calculated that the human resource leadership orientations of the pre-service teachers affected their structural leadership tendencies by ~32% with the partial mediation effect of charismatic leadership. Also, it discovered that the political leadership orientation of teacher candidates affects the structural leadership tendencies by ~37% with the partial mediation effect of charismatic leadership.

So, focusing on charismatic leadership skills in leadership programs to developed for teacher candidates can have important effects on the development of structural leadership skills. Thus, the effects of human resource and political leadership orientations can be more permanent. For this purpose, for example; Collaborative leadership developed by Keiser, Kincaid, and Servais (2011) or professional development school models suggested by Matsumoto, Yoshioka, and Fulton (2018) can used. While the collaborative leadership model can be adapted to the existing teacher education curriculum, the professional development school model is designed as a separate leadership incubation center that offers prospective teachers the opportunity to develop their leadership skills during teacher education. In other words, the collaborative leadership model adopts an in-school and curriculum-level approach, while the professional development model has an out-of-school understanding. Although the results of this research seem closer to the in-school model, the data obtained suggest that the charismatic leadership dimension should added to this model.

As a result of the research, it understood that the multidimensional leadership orientations of teacher candidates are quite high for both male and female teacher candidates. The highest leadership orientation seen in human resource leadership. In addition, it revealed that the structural leadership, political leadership and charismatic leadership orientations of the teacher candidates, respectively, were very close to each other and high. It understood that female participants' human resource leadership orientations are at a higher level than male teacher candidates. Thanks to these results, it has revealed that female teacher candidates have more cooperative leadership orientations. Thus, it can said that they have more leadership potential than men creating a more participatory environment in schools and creating a supportive organizational climate. It can said that the measurement model based on Bolman and Deal's four-frame leadership model is a structurally valid model for the multidimensional leadership orientations of pre-service teachers. According to this model, teacher candidates' charismatic leadership orientations have a partial mediating effect on the relationship between structural leadership orientations and human resource leadership and political leadership orientations. Teacher education, the development of four-frame leadership programs can considered in line with the results of this study. Thus, it will be possible to support and develop the multi-faceted leadership potentials of teacher candidates.

Limitations

An important limitation of this study is the lack of qualitative data. Besides, the results reached limited to the opinions of teacher candidates in only one education faculty. So, it can stated that the current sample size is enough the PLS-SEM literature (Lowry & Gaskin, 2014; Wong, 2013).

Implications for Further Research

With the results of this research, mixed methods can used to test the possible relationships between the four-frame leadership model and other leadership models. Large-scale modelling studies with a larger sample size can performed. New leadership training programs/projects can conducted based on the results of this research for teacher education.

Statement of Researcher

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